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DISSENT INTO CONFUSION: THE SUPREME COURT, DENIALISM, AND THE
FALSE "SCIENTIFIC" CONTROVERSY OVER SHAKEN BABY SYNDROMEJoëlle Anne Moreno^{a1} Brian Holmgren^{aa1}

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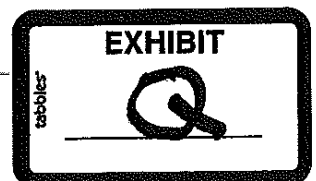
I. Introduction

Some scientific controversies are real; some are false. Challenges to the existence of global warming, and arguments about childhood vaccines causing autism or intelligent design versus evolution are false controversies because there is near consensus in the global scientific community on these questions.¹ Near consensus in science means that, as with all legitimate scientific research, there are unsettled questions that merit future investigation and reasonable experts may differ over select issues, but these unresolved matters do not threaten core scientific foundations. In contrast, false scientific controversies have been fabricated and are a form of denialism²--the rejection of scientifically sound *154 information in favor of purported "truth" claims that cannot be empirically supported.³ In her excellent work on manufactured controversies, Professor Leah Ceccarelli explains that a false scientific controversy is typically marked by an announcement that "there is an ongoing scientific debate in the technical sphere about a matter for which there is actually overwhelming scientific consensus."⁴ Professor Ceccarelli also identifies several common strategies used to manufacture false controversies, including (1) the use of mercenary scientists, (2) the use of cherry-picked data and manipulation of statistical methods, (3) the manufacture and promotion of doubt and uncertainty, and (4) the use of rhetoric to manufacture controversy in addition to uncertainty.⁵

In the United States Supreme Court's first opinion on the merits from its 2011-2012 term, three members of the Court contributed their authoritative voices to one of the most recent--and one of the most deadly--false scientific controversies, the purported scientific debate over the medical diagnosis of shaken baby syndrome (SBS), a prevalent form of abusive head trauma (AHT).

On October 31, 2011, in *Cavazos v. Smith*,⁶ the Supreme Court upheld Shirley Ree Smith's conviction for causing the death of her seven-week-old grandson, Etzel.⁷ This conviction was based on the jury finding that Etzel died from SBS, a diagnosis that has been recognized as clinically valid and evidence-based by an overwhelming majority of pediatric medical specialists for almost half a century,⁸ *155 substantiated by the bulk of the medical research in a range of scientific disciplines,⁹ recognized and defined by the Centers for Disease Control and Prevention,¹⁰ and widely accepted by courts in the United States¹¹ and numerous foreign countries. Following a brief review of the evidence presented at trial, the Supreme Court issued a scientifically accurate per curiam decision. The Court held that the Ninth Circuit had improperly "substituted its judgment for that of a California jury on the question of whether the prosecution's or defense's expert witnesses more persuasively explained the cause of a death."¹²

Justice Ginsburg, joined by Justices Breyer and Sotomayor, seized this opportunity to issue an unusual and scientifically inaccurate dissenting opinion. Based on their review of the medical and nonmedical evidence presented in this case, the dissenters opined that "[f]ew of the signs of SBS were present."¹³ More generally, the Court's summary adjudication of the



Smith case was “untoward” because the dissenters believed that “[d]oubt has increased in the medical *156 community ‘over whether infants can be fatally injured through shaking alone.’”¹⁴ Because these three justices purport to describe the shifting opinion of the “medical community,” one might initially mistake this finding for a distillation of the relevant medical literature on abusive head trauma/shaken baby syndrome (AHT/SBS).¹⁵ Nothing could be further from the truth. Instead the dissenters engage in two different, significant, and interrelated jurisprudential errors.

The first jurisprudential error, which will be fully addressed in this Article, is the dissenters' conclusion that few of the signs of SBS were present in this case which misconstrues the medical and nonmedical evidence presented by the prosecution and defense. The second is their sweeping conclusion that doubt has increased within the medical community regarding SBS which is based on the dissenters' careless and irresponsible independent extrarecord judicial fact-finding and contradicted by over seven hundred AHT/SBS medical articles written over the past four decades.¹⁶ Ignoring the overwhelming medical evidence, the justices support their opinion with single-sentence quotations from seven cherry-picked sources. This type of faux fact-finding, which perpetuates the false SBS *157 controversy, will be addressed in detail in a subsequent companion article.¹⁷ It is enough to note here that the dissenters base their conclusion on a handful of papers: (1) written by a tiny group of “mercenary scientists” whose regular testimony as defense-retained witnesses in child abuse and child homicide cases undermines the objectivity, legitimacy, and validity of their work;¹⁸ (2) that contain little original research and instead reflect manipulation of data and statistical methods,¹⁹ (i.e., opinion pieces, nonrandomized retrospective case series/reports, scientifically unsubstantiated opinions of other “mercenary” witnesses, and mischaracterizations of earlier AHT/SBS research);²⁰ (3) written not for academic and research purposes, but for use in legal proceedings; and (4) riddled with blatant methodological flaws and discredited by pediatric expert medical research and peer-reviewed scientific publications in a wide range of fields.²¹ Although the Smith dissenters could not garner a majority for their empirically unwarranted assertions regarding the purportedly unsettled state of the science of AHT/SBS, the scope and power of their view became undeniable on April 6, 2012. On that day, California Governor Jerry Brown commuted Smith's sentence, echoing Justice Ginsburg's conclusion that the AHT/SBS controversy made it “clear that significant doubts surround Ms. Smith's conviction.”²²

*158 A. The Supreme Court Enters an Ongoing “Controversy”

The dissenters' conclusions and choice of sources were not novel. Their findings echo the work of a small, partisan, and vocal group of law professors²³ and law students²⁴ who have recently challenged the diagnostic validity of AHT/SBS and advanced their own specious claims of a “scientific controversy.”²⁵ Justice Ginsburg notably did not cite any of these law review articles. However, because her opinion closely mirrors these works, she grants an unwarranted imprimatur of legitimacy to legal academic arguments that SBS “quite possibly does not exist,”²⁶ may be “junk science,”²⁷ that “SBS science in its current *159 conflicted state . . . does not support criminal convictions,”²⁸ and that the medical community has “deliberately discarded a diagnosis defined by shaking.”²⁹ These attention-grabbing claims fundamentally misconstrue and misstate the basic science involved in the medical diagnosis of child abuse and the type of medical expert testimony offered in legal proceedings. Like the Smith dissenters, law professors and students who claim to have “ripped the lid off” the scandal of false AHT/SBS convictions base their assertions on selective or improper citation to outlier medical papers that: (1) rely on unscientific methods; (2) are written almost exclusively by self-interested and highly-paid defense witnesses; and (3) ignore the vast quantity of valid, easily accessible, evidence-based medical research and the many public and professional statements that substantiate AHT/SBS as a clinically valid diagnosis.³⁰

Supreme Court justices, law professors, and law students are generally not scientists. As Professor Susan Haack astutely observed, when courts rely on information beyond their ken they must assume that “[g]iven the investigative character of the scientific enterprise and the pervasive reliance of individual scientists on evidence discovered by others, the core values are honesty (both with yourself and with other people) about what the evidence is and where it leads.”³¹ Thus, especially when

wading into a purported “controversy,” courts should hesitate before relying on any so-called child abuse “expert” whose public statements include “[a]s far as I’m concerned, every goddamn conviction in this country over the past 25 years which is based on testimony regarding shaking has to be overturned,”³² inviting skepticism regarding the expert’s accuracy, honesty, and objectivity.

The problem of biased and scientifically unsound defense witness testimony in the AHT/SBS context has increasingly aroused the attention of various medical associations. For example, a recent article in the Journal of the American Medical Association described how legal cases involving AHT/SBS have been harmed by *160 “physicians with variable credentials [who] have a willingness to disparage scientifically grounded and accepted testimony, use unique theories of causation, omit pertinent facts or knowledge, use unique or unusual interpretations of medical findings, make false statements, or engage in flagrant misquoting of medical journals.”³³ In a similar effort, physicians involved in the diagnosis and treatment of AHT/SBS have recently called for new certification programs and specific rules of ethical expert conduct that would “provide some degree of certainty that physicians testifying both for the prosecution and defense as AHT medical experts are indeed expert, experienced, and unbiased.”³⁴ In the interim, judges can use Federal Rule of Evidence 702 (or its state equivalent) to exclude or limit the testimony of partisan experts who “have developed their opinions expressly for the purposes of testifying.”³⁵

B. The AHT/SBS “Controversy” is False

Despite all the ballyhoo, there has been no paradigm shift in the scientific support for the diagnosis of AHT/SBS. The empirical evidence includes a continuously growing body of “evidence-based, peer-reviewed medical literature with 40 years of contributions by pediatricians, neuroradiologists, clinical and forensic pathologists, ophthalmologists, and physiologists clearly supporting the construct of a medical diagnosis of AHT.”³⁶ At the clinical level, “[m]edical experts agree with the physical, laboratory, and imaging findings associated with the medical construct of AHT, which can include subdural hemorrhage, retinal hemorrhage, encephalopathy, and often evidence of previous trauma or other bodily injury.”³⁷

*161 Of course, as with any area of science, the existence of extensive substantiating medical evidence does not mean that every question has been answered, that there are no areas of legitimate uncertainty, or that research should not continue. But false claims of a scientific paradigm shift completely mischaracterize the existing medical evidence. Law professors and students who seek to analogize these claims to the false convictions uncovered using DNA evidence³⁸ embrace a false science and paradoxically reject the core lesson of the Innocence Project—that good science makes good law.³⁹

C. How False “Controversies” Create Real Problems

Unlike most of the academic arguments that consume legal scholars,⁴⁰ it is a matter of life or death when judges who must decide child abuse cases mistake biased, poorly substantiated, and outlier advocacy for legitimate medical information.⁴¹ Proponents of the false AHT/SBS controversy transcend academic discourse to undermine real world public health and child abuse prevention efforts by suggesting that shaking an infant is not dangerous and cannot cause serious injury.⁴² The flaws in Justice Ginsburg’s dissenting opinion may not be obvious, so *162 they must be corrected before these mistakes gain traction with future courts, the media, and the public.

This correction must be prompt because incidences of AHT in children are increasing. A new multicenter study reveals that the overall rate of AHT, which is the leading cause of death from child abuse, has increased over 60%, from 8.9 to 14.7 per 100,000 children under five years old, over the past five years.⁴³ The current incidence of AHT in children under one year is 20 to 30 cases per 100,000, with a fatality rate of 20% and a significant disability rate of 66%.⁴⁴ As noted above, the promulgation of

scientifically unsubstantiated claims that shaking cannot harm an infant sends a dangerous message to parents and caregivers and undermines important child abuse prevention efforts.⁴⁵

This correction must be accurate and empirically sound. As shown below, the Smith dissent reveals how courts carelessly or inadvertently rely on pseudoscientific information resoundingly rejected within multiple scientific fields.⁴⁶ This is more likely to occur when the court engages in its own fact finding and especially when it fails to use valid and transparent source selection criteria. These problems are compounded when brief quotations are excerpted without attention to the remainder of the source (including the description of methods), concurrent or subsequently published critical responses to the selected work, or other articles on the same topic that reach different conclusions. It is vitally important that future courts do not uncritically rely on the Smith dissent, or the sources cited therein, to make similar unscientific mistakes.

This correction must be clear and accessible to nonscientists. In a growing number of child homicide and abuse cases involving a medical diagnosis of AHT/SBS (based on clear clinical findings and extensive medical research), scientific-sounding information of dubious validity has increasingly been paraded before trial courts and offered to support postconviction claims of "factual innocence" or "newly discovered evidence."⁴⁷ Ironically, this may be attributed, in *163 part, to the Daubert standard, which encourages judges to consider publication as a measure of scientific validity. The problem is that judges mistake publication in any medical journal for a determination that the author has used scientifically sound methods to reach valid conclusions. What courts routinely fail to understand is that not all medical journals are the same, running the gamut from prestigious peer-reviewed journals to indiscriminating pay-to-publish outlets. More importantly, even well regarded journals will sometimes publish an article that presents an outlier view specifically to expose the article to critique from others in the field.⁴⁸

*164 Finally, this correction must embrace both the science and law of AHT/SBS. In many AHT cases, including the Smith case, the defendant makes admissions to medical professionals, social services personnel, or to the police. There is a substantial and growing body of research demonstrating that incriminating statements and confessions (made to family members, doctors, social service personnel, or police officers) often describe a mechanism of injury that is consistent with the clinical findings, thereby confirming the medical evidence.⁴⁹ But some law professors have recently argued that defendant confessions and admissions should be ignored because such statements are the product of a pervasive child abuse prosecution bias.⁵⁰ Despite the lack of any evidence to support this "bias," one medical author (cited approvingly by the Smith dissenters), simply states that incriminating statements and confessions in AHT/SBS cases are inherently unreliable and should be irrelevant to any determination of causation.⁵¹ While arguments regarding cognitive biases are a recent academic fad, it is ridiculous to posit that every medical professional, social worker, law enforcement personnel, or anyone else to whom a child abuse/homicide suspect makes incriminating statements is so tainted by a pro-prosecution bias that they are blind to all other evidence and cannot exercise independent judgment.

As discussed below, before Smith, most courts accurately concluded that the diagnosis of AHT/SBS is supported by extensive valid relevant medical evidence and is generally accepted in the relevant medical community.⁵² The Smith dissent, which provides a model for examining the above-described problems in detail and *165 context, if uncorrected, will redound to the lower courts and distort public awareness and opinion regarding AHT/SBS.⁵³

D. An Evidence-Based Approach to AHT/SBS

It is against this backdrop of increasing incidence of child abuse and child homicide, decreasing understanding of the clinical diagnostic criteria and medical literature, and a deliberate effort to politicize AHT/SBS by mischaracterizing it as prosecutorial overreaching that this Article proposes an evidence-based approach to these interdependent scientific and legal questions.

Evidence-based medicine is a widely used and commonly misunderstood concept. According to Dr. David Sackett, the originator of the concept, “[e]vidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research.”⁵⁴ This Article’s approach adopts the fundamental principle of evidence-based review, which is that not all evidence is of equal validity. Thus, in *Smith* we compare the clinical experience of the five diagnosing physicians and examine whether their methods and conclusions are consistent with the evidence base that supports the accuracy of the AHT/SBS diagnosis. This methodology is a direct response to the *Smith* dissenters’ myopic review of the facts, which implicitly endorses efforts to “misrepresent the state of knowledge in the medical community regarding the reality of child abuse, and, in particular, AHT/SBS.”⁵⁵ This methodology also *166 reclaims and clarifies the evidence-based approach by identifying the *Smith* dissenters’ unwarranted reliance on work that purports to be “evidence-based,” but is not.⁵⁶

Toward this end, Part II provides a brief historical perspective on the genesis of the false AHT/SBS controversy. Part III addresses how the dissenting justices distorted the medical evidence introduced by the prosecution and the defense and provides an evidence-based response to each of the five specific “problems” with the medical evidence identified by the *Smith* dissenters. Part IV examines how the Supreme Court justices who dissented in *Smith* also misinterpreted the nonmedical evidence introduced at trial. Finally, the conclusion identifies the *Smith* dissent as an example of the more general “tail wagging the dog” problem that arises during postconviction review when judges fail to properly apply the legal standard, and opt instead to engage in extrarecord fact-finding used to support the speculation that a conviction was wrongful. A companion article explores the additional and more general problems created by the *Smith* dissenters’ independent review of the medical literature.⁵⁷

II. The History of the False AHT/SBS “Controversy”

A thorough examination of the history of the false AHT/SBS controversy is beyond the scope of this Article. It is helpful, however, to explore the critical events that brought us to where we are today.

As noted above, the original articles recognizing SBS were published in the early 1970s.⁵⁸ Since then, the empirical evidence supporting the validity of the AHT/SBS diagnosis has grown to include a body of “evidence-based, peer-reviewed medical literature with 40 years of contributions by pediatricians, neuroradiologists, clinical and forensic pathologists, ophthalmologists, and physiologists clearly supporting the construct of a medical diagnosis for AHT.”⁵⁹

At the clinical level, “[m]edical experts agree with the physical, laboratory, and imaging findings associated with the medical construct of AHT, which can include subdural hemorrhage, retinal hemorrhage, encephalopathy, and often evidence of previous trauma or other bodily injury.”⁶⁰ Contrary to the inaccurate representations regularly made by many defense-retained medical witness and legal academics, an AHT/SBS diagnosis is not the automatic result of the so-called triad of injury findings.⁶¹ Instead, it is the product of an extensive differential *167 diagnostic process that considers all aspects of the medical evaluation (i.e., clinical evaluation, clinical history, diagnostic and laboratory testing, evidence of cerebral trauma, evidence of ocular trauma, imaging studies, evidence of additional injuries, and, in the event of death, pathology and autopsy results) along with all of the investigative information provided by relevant nonmedical sources.⁶² Thus, the repeated law professor/law student complaint that criminal convictions are based exclusively on so-called triad evidence is false.⁶³ More recent academic claims that *168 pediatricians and emergency room physicians who diagnose AHT/SBS are tainted by a “prosecution bias” are empirically unsupportable, a transparent attempt to garner attention with faddish behavioral science jargon, and patently absurd.⁶⁴

A. Commonwealth v. Woodward⁶⁵

In 1997, Louise Woodward's prosecution brought the term "shaken baby syndrome" into the national spotlight. The highly publicized case of the English au pair who fatally shook and slammed eight-month-old Matthew Eappen brought international public attention to the reality of infant AHT. The hotly contested trial also brought national attention to the use of highly paid defense medical witnesses to challenge the accuracy of a child abuse diagnosis and to advance outlier and highly controversial "alternative theories" of causation that purport to explain traumatic or fatal infant injuries including, in this case, a two-inch skull fracture. Woodward marks the origin of the false AHT/SBS controversy--at least in part because the defendant, who was convicted of second-degree murder by a jury, was later freed by the judge.⁶⁶ This fact alone could explain the resulting public uncertainty regarding the weight of the prosecution's medical evidence. *169 Irresponsible journalists, however, including Mike Wallace of 60 Minutes, exacerbated the confusion.⁶⁷

The public confusion that began with Woodward has been transformed into an apparent AHT/SBS "controversy" by some of the doctors who testified in Woodward⁶⁸ who, along with a handful of others, have spent the past fifteen years providing a plethora of defense-supported medical challenges in child homicide and child abuse cases. These include contesting the admission of the diagnosis of AHT/SBS in pretrial hearings, Daubert/Frye evidentiary challenges,⁶⁹ the increased use of medical witnesses to testify to outlier or unsubstantiated causation theories at trial, and a concomitant increase in postconviction challenges based on claims of a paradigm shift in the medical community.⁷⁰ To date, most courts have accurately concluded that the diagnosis of AHT/SBS is supported by valid medical evidence and is generally accepted in the relevant medical community.⁷¹ To our *170 knowledge, not a single appellate court has rejected evidence of AHT/SBS as scientifically unreliable under the Daubert or Frye evidentiary standard--an outcome one would expect if the science was truly unsound.

At least one trial judge with extensive experience in child abuse cases has opined that witnesses (and even legal academics) who misrepresent the AHT/SBS medical evidence create real problems for the courts.⁷² According to Judge Gill, "It is disconcerting, if not frightening, when a law professor professes factual, technical, and legal misleading statements in public and professional publications."⁷³ The Smith dissent has the capacity to create far greater problems as the most influential, if not the first, appellate decision to endorse the false AHT/SBS controversy.⁷⁴

***171 B. State v. Edmunds**⁷⁵

Seven years ago, Professor Keith Findley enlisted the help of Wisconsin Innocence Project students in his effort to seek postconviction review for Audrey A. Edmunds.⁷⁶ Edmunds had been convicted of reckless homicide based on evidence that seven-month-old Natalie Beard suffered both shaking and impact head trauma while in the defendant's care.⁷⁷ Her conviction was affirmed on direct appeal,⁷⁸ and her subsequent federal habeas petition was denied.⁷⁹ In 2006, she filed a motion for a new trial asserting "there were significant developments in the medical community around 'shaken baby syndrome' in the ten years since her trial that amounted to newly discovered evidence."⁸⁰ In support of this petition, Edmunds presented affidavits and testimony from several medical witnesses⁸¹ who claimed that the science of AHT/SBS had "changed" since the time of her trial and now supported alternative theories of causation for many of the medical findings relied upon by the jury.⁸² The trial judge, Daniel Moeser, denied Edmunds' petition holding that, although some of the defense medical witnesses were "credible," the medical science supporting the conviction was, if anything, stronger a decade later, and that evidence of the defendant's guilt was extensive.⁸³ Judge Moeser detailed his findings in an extensive written order.⁸⁴

*172 The Wisconsin Court of Appeals reversed Judge Moeser, finding that Edmunds was entitled to a new trial because the "newly discovered evidence in this case shows that there has been a shift in mainstream medical opinion since the time of

Edmunds's trial as to the causes of the types of trauma Natalie exhibited.”⁸⁵ According to the court of appeals, Judge Moeser erred because he “expressly found that Edmunds’[s] new evidence and the State’s new evidence were both credible . . . [and] then weighed the evidence and concluded that the State’s evidence was stronger.”⁸⁶ The court of appeals held that “it was not the [trial] court’s role to weigh the evidence . . . it was required to determine whether there was a reasonable probability that a jury, hearing all the medical evidence, would have a reasonable doubt as to Edmunds’s guilt.”⁸⁷ Thus, the court of appeals’s narrow and technical ruling was based solely on speculation that “a jury could have a reasonable doubt as to a defendant’s guilt even if the State’s evidence is stronger,”⁸⁸ so Edmunds was entitled to a new trial.⁸⁹

A thorough discussion of Edmunds is beyond the scope of this Article, but because this case is invariably cited as evidence that courts are starting to reject the science of AHT/SBS, some clarification is required. The trial judge’s opinion that a few defense witnesses were “credible” provides the only support for the sweeping and erroneous conclusion by the appellate court that “newly discovered evidence in this case shows that there has been a shift in mainstream medical opinion,”⁹⁰ which in turn, presages the similarly erroneous conclusion of the Smith dissenters. This conclusion must be understood in context as the ipse dixit of a few defense witnesses who testified in Edmunds’s post-conviction hearing for the purpose of advancing self-serving (but empirically unsupportable) claims that a shift in “mainstream medical opinion” is underway.

Edmunds should not be misunderstood as heralding a significant change in medical opinion on SBS/AHT. The mere fact that a single state court judge found a *173 small group of doctors (of whom only one was actively engaged in the diagnosis of child abuse) “credible” is not evidence of a paradigm shift-- especially when the judge’s opinion is contradicted by four decades of scientific consensus on the AHT/SBS diagnosis across a wide range of pediatric medical subspecialties and countless physicians who are more credible because they actually diagnose abuse as part of their clinical medical practice. The extensive biomechanical research on infant head trauma also provides sound additional reasons to suspect the accuracy of Judge Moeser’s credibility conclusion.⁹¹

*174 C. Law Professors and Students Add to the Growing Confusion

If Woodward marks the advent of public awareness and confusion regarding AHT/SBS, Edmunds marks the tipping point for the new false controversy.⁹² Starting in 2009, a small group of law professors⁹³ and law students⁹⁴ began to advance the view that wrongful convictions in child homicide and child abuse cases were creating a “criminal justice crisis.”⁹⁵

Law professors’ and students’ recent self-serving attempts to garner attention with arguments that AHT/SBS “quite possibly does not exist,”⁹⁶ may be “junk science,”⁹⁷ that “SBS science in its current conflicted state . . . does not support criminal convictions,”⁹⁸ and that the medical community has “deliberately discarded a diagnosis defined by shaking,”⁹⁹ have provoked extensive criticism from all corners of the pediatric medical community. According to Allison Scobie-Carroll, program director for the child protection program at Children’s Hospital Boston, “For those [of] us who actually see these children, there is no debate.”¹⁰⁰ *175 According to Dr. Robert W. Block of the American Academy of Pediatrics, the so-called AHT/SBS controversy was created

by a few people who ignore the known science and excuse the confessional literature, the clinical experience that many of us have working with babies who are injured or killed and the people who hurt them, and choose instead to come up with alternative hypotheses, none of which are substantiated by reasonable science.¹⁰¹

Dr. Desmond Runyan, M.D., Professor of Social Medicine and Pediatrics at the University of North Carolina School of Medicine, specifically criticized Professor Tuerkheimer’s effort to discredit the diagnosis of AHT/SBS as based on “factual an[d] conceptual errors” including her misuse of his own research.¹⁰² According to Dr. Runyan:

Where Professor Tuerkheimer states that there are more than 1000 babies labeled with the diagnosis of shaken baby, she used an estimate derived from a study that I helped design and conduct. In North Carolina we had 80 cases of children less than 2 years of age who were diagnosed as having suffered an inflicted traumatic brain injury in 2000 and 2001. This yielded a rate of 17/100,000 children in the first 2 years of life. In that study we undertook a careful blinded secondary review of the case circumstances and found that the diagnoses were accurate and well done and the[re were] only two cases that we found misidentified. In one case we determined it was most likely an accident and in another we concluded [t]he case was likely abusive[.] In both cases the physician involved called it "undetermined." From the 80 North Carolina cases that constituted our sample over two years, only 54 cases proceeded to the courts. In 80% of those cases there was a guilty plea by the perpetrator. Thus, there were six trials each year and five convictions.¹⁰³ Thus, according to Dr. Runyan, Professor Tuerkheimer improperly based her claim of 1,000 SBS diagnoses on his work. Dr. Runyan indicated that, when Professor Tuerkheimer cited his research, she omitted any data that would have undermined her argument. Professor Tuerkheimer failed to acknowledge the critical fact that in the twelve North Carolina prosecutions that went to trial, "[t]he information the juries used went far beyond Prof. Turkheimer's 'triad' and included careful histories, other injuries, and diagnostic testing to rule-out other diagnoses."¹⁰⁴ *176 Thus, according to Dr. Runyan, his research does not support "[h]er premise that there are many hundreds of people languishing in jails with false convictions."¹⁰⁵

A more general criticism of Professor Tuerkheimer and everyone else who has opined that there is a "criminal justice crisis" of false AHT/SBS convictions, is that child physical abuse cases are significantly underreported and therefore underprosecuted.¹⁰⁶ The fact that law professors are, at least in part, promulgating the false AHT/SBS controversy is deeply troubling to Judge Gill who believes that Professor Tuerkheimer's over-extension of the highly questionable medical minority view on the subject into the legal world . . . are not medically, scientifically or legally correct. They suggest a legal tilting at her new "innocence project." . . . But her project is guilty of existing pretty much in her own mind. Her sources are scant and wrong.¹⁰⁷

With no support from the pediatric subspecialist communities, legal academics seeking to advance the AHT/SBS false controversy have been (unsurprisingly) forced to rely on the same handful of defense-employed witnesses who regularly testify for the defense in child abuse and child homicide cases for all of their "scientific" support.¹⁰⁸ Since the Woodward trial, these medical witnesses have published articles challenging the diagnosis of AHT/SBS and proposing a range of alternative causal theories to explain traumatic and deadly brain injuries in infants.¹⁰⁹ These articles provide publications that can be cited from the witness stand to support defense-sponsored testimony opining that an infant's traumatic brain injury was not caused by abuse. However, judges and juries are apparently unaware of the fact that, with few exceptions, these papers have encountered overwhelming evidence-based critique from a broad range of medical *177 professionals. They are also generally viewed as being written for the purpose of maintaining or increasing the authors' lucrative defense witness appearances.¹¹⁰

As the preceding discussion illustrates, the outlier views expressed by defense medical witnesses and parroted in law review articles is self-validating.¹¹¹ The *178 academics cite the same handful of defense medical witnesses, the media cites both, the defense medical witnesses benefit from the publicity and are hired in more cases, and the cycle begins anew.

The most recent law review articles eliminate the circularity in favor of direct collaboration.¹¹² With everyone on the same page, law professors and defense experts work together to promote doubt and uncertainty that (1) AHT/SBS is an anecdotal medical diagnosis without scientific proof;¹¹³ (2) there is no "evidence-based" medical research to support the AHT/SBS diagnosis;¹¹⁴ (3) adults cannot *179 shake infants hard enough to cause injuries ascribed to AHT/SBS based on biomechanical research;¹¹⁵ (4) violent shaking would break the infant's neck or result in other thoracic injuries;¹¹⁶ (5) suspects' confessions are false, cannot explain the injuries, and result from coercive prosecution-biased interrogation;¹¹⁷ (6) AHT/SBS

is routinely diagnosed solely on triad findings (i.e., retinal hemorrhages, subdural or subarachnoid hemorrhages, and brain encephalopathy);¹¹⁸ (7) the diagnostic triad is nonspecific;¹¹⁹ (8) alternative *180 medical conditions and accidental traumas account for injuries misdiagnosed as AHT/SBS;¹²⁰ and (9) injuries cannot be timed to identify a perpetrator because children can have “lucid intervals” after severe injuries.¹²¹ The popular press is *181 complicit when it presents sympathetic or sensationalistic claims, but ignores the extensive empirical evidence that doctors rely on legitimate diagnostic criteria for AHT/SBS. Legitimate medical responses that utilize scientific “controversy” terminology may inadvertently add to the confusion.¹²²

The Smith dissent makes it more likely that these increasingly common but unreliable medical opinions will be admitted in future child homicide and abuse cases. No appellate court has ruled that AHT/SBS fails to satisfy standards of evidentiary reliability for admission. But the effect of defense challenges at trial are more difficult to measure, because acquittals are the only outcome likely to be reported on, if at all, in the media. There has been no systematic research designed to assess the impact of defense testimony attacking AHT/SBS on the adjudication of child homicide or child abuse cases. But abundant anecdotal evidence suggests that when such evidence is presented by defense-retained medical witnesses, jurors and judges in child abuse and child homicide cases are more inclined to acquit defendants or to convict them of less serious offenses.

These concerns are more profound during postconviction proceedings. The legal standards for raising postconviction challenges (i.e., factual innocence, newly discovered evidence, and ineffective assistance of counsel claims) provide effective mechanisms for advancing specious but scientific-sounding claims. The standards for scientific evidence in postconviction proceedings are murky. Every newly published medical article or law review article (regardless of content or quality) that challenges the “orthodoxy,” proposes an alternative causation theory, or purports to have uncovered a “paradigm shift” provides the opportunity to argue that the defendant is factually innocent, that there is newly discovered evidence, or that trial counsel was ineffective for failing to challenge the AHT/SBS diagnosis. Whenever an appellate court relies on unsubstantiated scientific claims, or a misunderstanding of precedent, to find that the AHT/SBS “controversy” requires a new trial, this decision garners significant media attention. The media reports focus, not on the science, but on “groundbreaking” revelations of blameless parents and caretakers languishing in jail and their brave fight against the intransigent pro-prosecution medical mainstream.

Ironically, the Smith dissent cannot be attributed to the normal shortcomings of the AHT/SBS postconviction challenge. Smith's habeas petition did not include legal affidavits from defense medical witnesses attacking the medical testimony at trial. In fact, the petition contained just one citation to the routinely cited defense *182 literature and did not include any postconviction medical testimony from defense witnesses proposing that “newly discovered evidence” established Smith's actual innocence. The legal briefs also did not include any of the evidence or arguments that had been omitted from the habeas petition. Thus, Smith is especially troubling because the dissenters themselves went looking outside the record for evidence to support their conclusion that “[d]oubt has increased in the medical community ‘over whether infants can be fatally injured through shaking alone.’”¹²³

III. Cavazos v. Smith: 1996-2012

A. Fifteen Years of Litigation, Three Decisions from the Ninth Circuit Granting Habeas Relief, and Three Reversals from the United States Supreme Court

Shirley Ree Smith was arrested in 1996 and charged with assault on a child resulting in death.¹²⁴ She was tried the following year, convicted, and sentenced to fifteen years to life.¹²⁵ Following exhaustion of her state appellate challenges,¹²⁶ the defendant brought a writ of habeas corpus in federal court.¹²⁷

In her federal habeas petition, Smith claimed that her due process rights had been violated because the evidence introduced at trial was “constitutionally insufficient” particularly with respect to “one element of the crime—the cause of the child's death.”¹²⁸ On February 6, 2006, the Ninth Circuit reversed her conviction based on its finding that no rational jury could conclude beyond

a reasonable doubt that Smith caused the child's death, and the defendant was released from prison.¹²⁹ This ruling was reversed and remanded by the United States Supreme Court on April 30, 2007,¹³⁰ for further consideration in light of **183 Carey v. Musladin*,¹³¹ in which the Court emphasized the deference owed to state court juries in federal petitions for postconviction review.¹³²

On December 4, 2007, the Ninth Circuit reinstated its 2006 decision based on a finding that "the opinion of the prosecution experts that shaking of the infant had caused death was wholly unsupported by the physical evidence."¹³³ On January 19, 2010, the Supreme Court again reversed and remanded to the Ninth Circuit for further consideration in light of *McDaniel v. Brown*,¹³⁴ a new case clarifying the standard for habeas review.¹³⁵

On October 29, 2010, the Ninth Circuit reinstated its 2006 decision based on its finding, once again, that "nothing in the physical evidence supported the prosecution experts' testimony as to the cause of death."¹³⁶ The Supreme Court reversed this decision for the third time on October 31, 2011,¹³⁷ and on February 3, 2012, the Ninth Circuit affirmed the judgment of the district court denying Smith's petition for a writ of habeas corpus.¹³⁸

On April 6, 2012, California Governor Jerry Brown commuted Smith's sentence stating, "it is clear that significant doubts surround Ms. Smith's conviction."¹³⁹

B. Smith Illustrates Problems Endemic to Postconviction Review of Fact-Intensive Cases

An unfortunate reality of the appellate process is that pertinent facts from the trial record are often lost, ignored, distorted, taken out of context, or omitted as the case is presented in later hearings. In some cases, decreased judicial reliance on the facts may be appropriate, especially where the facts have little bearing on the legal analysis. However, child abuse cases are inherently fact based and *Cavazos v. Smith* provides a classic example of the problems that arise as multiple layers of appeals move the courts further from the relevant facts the jury considered.

At every level of appeal, the critical issue in Smith was the defendant's claim that there was insufficient evidence of her guilt.¹⁴⁰ This claim pertains to both the sufficiency of the medical evidence regarding the victim's cause of death and the nonmedical evidence implicating the defendant's acts as the cause of the victim's **184* fatal injuries.¹⁴¹ The most thorough and complete recitation of the medical and nonmedical evidence appears in the February 10, 2000, decision from the California Court of Appeal.¹⁴² Thus, this discussion of the facts is principally derived from that decision. However, possible sources of confusion and additional or conflicting facts contained in subsequent decisions from the Ninth Circuit and the United States Supreme Court have also been identified and explained.¹⁴³ What follows is a review of the nonmedical and medical evidence presented at trial. Where appropriate, the evidence presented by the prosecution and the defense and relied upon by the reviewing courts will be compared to the relevant evidence base in the widely available research literature.

***185 C. The Nonmedical Evidence Presented to the Smith Jury**

1. Etzel's Living Arrangements and Caregivers

Etzel Glass was born on October 10, 1996,¹⁴⁴ and died on November 29, 1996.¹⁴⁵ Etzel had been born two weeks before his due date with jaundice and a heart murmur, both of which had fully resolved before his death.¹⁴⁶ No additional complications surrounding his birth were reported.¹⁴⁷

At the time of his death, Etzel lived with his grandmother, the defendant, Shirley Ree Smith.¹⁴⁸ Etzel's mother, Tomeka, his sister, Yolanda (four years old), and his brother Yondale (fourteen months old) along with several other family members also lived with Smith.¹⁴⁹ Smith helped Tomeka care for her children and she was generally described as a loving grandmother who was not harsh or abusive to her grandchildren.¹⁵⁰

2. Etzel Appeared Normal During the Day and Evening Before He Died

On November 29, 1996, Smith took Etzel and his siblings to visit her sister Renee Townsend.¹⁵¹ Etzel seemed normal during the day.¹⁵² He was eating, smiling, moving his arms and legs, and having normal urination and bowel movements.¹⁵³ That night, at approximately 11:30 p.m., after Etzel had been fed, changed, and bathed by his mother, Tomeka put him to sleep on his stomach on a sofa in the living room of Renee's apartment.¹⁵⁴ Renee left for work when Etzel was put down to sleep.¹⁵⁵ Etzel's brother, Yondale, slept on the same sofa with *186 Etzel while his sister, Yolanda, slept on a love seat in the same room.¹⁵⁶ Smith slept on the floor next to the sofa.¹⁵⁷ Renee's children slept in the room they shared.¹⁵⁸ Etzel was fine at 11:30 p.m. when Tomeka put him to sleep.¹⁵⁹ Tomeka remained in the living room for about an hour.¹⁶⁰ During this time, she checked his diaper and noticed him moving.¹⁶¹ Although Tomeka normally slept in the living room, that night she went into Renee's bedroom to listen to music and fell asleep.¹⁶² Thus, after midnight Smith was Etzel's only caregiver.¹⁶³

3. Etzel's Condition While in the Defendant's Care

At approximately 1:30 a.m., Smith awoke and stated she found Etzel on the floor.¹⁶⁴ "She picked him up, rocked him back to sleep, and placed him on the couch in the same position (stomach down, head to the side)."¹⁶⁵ There was no indication that Smith noticed anything unusual about Etzel at that time.¹⁶⁶

The suggestion that Etzel's injuries could have been caused by a fall from the couch to the floor is clearly contradicted by the medical evidence, general well-accepted information about pediatric development, and common sense. As discussed below, none of the five medical experts who testified during the trial suggested that Etzel's injuries and death could have been attributable to a short fall of less than two feet. The medical literature likewise does not support this conclusion.¹⁶⁷ Moreover, because a seven-week-old child can barely scoot and cannot roll over, it is developmentally highly unlikely that Etzel accidentally fell off a couch. Given these facts, it is reasonable to conclude that Smith provided a false story of a fall to explain Etzel's injuries. The child abuse literature is replete with this type of "accidental fall" from household items as a history offered to explain a range of severe injuries. In fact, these caretaker explanations are so common they are referred to in the professional literature as "the killer couch" story.¹⁶⁸ In fact, research has confirmed that a purported fall of fewer than three *187 feet, when offered to account for severe head trauma, is one of several false histories that permit a diagnosis of AHT to be made with statistical reliability.¹⁶⁹

Smith said that she awoke again at 3:20 a.m. because she had to go to the bathroom.¹⁷⁰ After she returned from the bathroom, she noticed that Etzel had thrown up and had blood on his right nostril.¹⁷¹ When Etzel did not respond to her touch, Smith "rushed into the bedroom holding Etzel and wakened Tomeka."¹⁷² "Etzel was limp and appeared to have vomit coming from his nose."¹⁷³ Smith said, "Tomeka, Tomeka. Something is wrong with Etzel. . . . [C]all 911."¹⁷⁴ Smith then passed the baby to Tomeka, who then called 911.¹⁷⁵

4. Defendant's Various Statements to Investigators Regarding Etzel's Death

Firefighters and paramedics responded to the apartment at 3:36 a.m.¹⁷⁶ When emergency personnel arrived, Smith was "apprehensive" and stated that she thought Etzel had fallen off the couch.¹⁷⁷ Etzel was clothed, laying on the bed, and had bright red blood in one nostril.¹⁷⁸ He was warm, but he was not breathing and had no heartbeat.¹⁷⁹ The firefighters administered CPR without success.¹⁸⁰ Etzel *188 was transported to the hospital and arrived at 3:50 a.m.¹⁸¹ At that point, he was in full cardiac arrest, and was pronounced dead shortly thereafter.¹⁸²

Doctors initially suspected that Etzel had died as a result of Sudden Infant Death Syndrome (SIDS).¹⁸³ After the autopsy was concluded, however, the cause of death was found to be SBS.¹⁸⁴

On December 5, 1996, a social worker, Linda Reusser, went to Renee's apartment and told Tomeka and Smith that the cause of death had been changed to SBS.¹⁸⁵ Ms. Reusser asked Smith what happened the night of Etzel's death.¹⁸⁶ Smith told her that Yondale had awakened at about 3:20 a.m. and that she had gone to comfort him.¹⁸⁷ Smith said she also went over to Etzel and saw that he was face down.¹⁸⁸ Smith said she became worried when she touched Etzel and he did not respond so she picked him up and gave him "a little shake, a jostle" to waken him.¹⁸⁹ Smith said that Etzel's head was flopped back when she picked him up.¹⁹⁰ Smith then demonstrated how she had picked Etzel up by his armpits with her hands even with her shoulders and gave what was described as "a quick jostle" making a smooth rather than a jerky motion.¹⁹¹ At that point, Smith stopped talking.¹⁹² The social worker then asked Smith, "What happened next?" and Smith replied "Oh my God. Did I do it? Did I do it? Oh, my God."¹⁹³ Ms. Reusser also testified that Tomeka told Smith, "If it wasn't for you, this wouldn't have happened."¹⁹⁴ Finally, the social worker told Tomeka she was going to remove Yondale and Yolanda while the investigation continued.¹⁹⁵

Los Angeles police officers interviewed Smith four days later on December 9, 1996.¹⁹⁶ Smith stated that Etzel had been fine at 11:30 p.m. on the night of November 29.¹⁹⁷ She said that she was awakened when Yolanda fell on her.¹⁹⁸ *189 Smith then noticed that Etzel needed to be changed and when she picked him up, his head flopped back and he had vomit around his mouth.¹⁹⁹ At first, Smith told the police that she had shaken Etzel,²⁰⁰ but she corrected herself claiming instead that she had "twisted" him to try to elicit a response from him.²⁰¹ Smith said that she shook Etzel for "just a matter of a few seconds."²⁰² Smith also told the police that Etzel had "fallen off the couch"²⁰³ earlier in the evening, was fine, and was laid back down to sleep on the sofa.²⁰⁴

As discussed below, the medical evidence directly contradicts the defendant's statements regarding the sequence of events. It supports the inference that events happened in the reverse order--that Etzel became unresponsive after he had been shaken.²⁰⁵

5. The Trial Testimony

At trial, Tomeka denied that she had blamed Smith during the interview with Ms. Reusser.²⁰⁶ Tomeka also testified that the social worker fabricated both Smith's admissions that she had shaken or jostled Etzel and Smith's demonstration of how she shook Etzel to wake him.²⁰⁷ According to Tomeka, Ms. Reusser had accused Smith of killing Etzel and Smith had responded by saying, "No I didn't."²⁰⁸ Finally, Tomeka testified that she could not remember any of the statements she made to the police.²⁰⁹ Renee Townsend testified that Smith did not have a temper and that she only corrected the children verbally.²¹⁰ "Smith herself testified very briefly, denying that she had shaken Etzel on the night of his *190 death."²¹¹ The prosecutor did not subject the defendant to substantive cross-examination.²¹²

6. Summary of the Nonmedical Evidence

Medical evidence is a dominant aspect of most child abuse and child homicide cases. However, nonmedical evidence is an important component of these cases and may frequently be dispositive in the minds of jurors, especially in cases that involve conflicting expert witness testimony.

In Smith, the nonmedical evidence established that Etzel was neurologically normal in the hours leading up to the time when he was left in Smith's exclusive care, indicating that he had not sustained any severe head trauma up to that point.²¹³ This uncontradicted evidence provided a clear timeline of events establishing that Etzel's neurological symptoms and death occurred only after he was in Smith's care.²¹⁴ The jury also viewed this evidence in conjunction with Smith's own changing, conflicting, and implausible stories offered to account for Etzel's fatal injuries. These include, most notably, Smith's admission to the fatal mechanism of injury-- shaking seven-week-old Etzel--although she unsurprisingly attempted to minimize the force associated with her shaking her grandson. Given that the jury also heard extensive medical evidence, discussed in the next section, establishing that Etzel died from AHT caused by violent shaking shortly after these injuries were inflicted, it should be clear that a rational trier of fact could have found the prosecutor proved the essential elements of the crime beyond a reasonable doubt.

D. The Medical Evidence Presented to the Smith Jury

At trial, the medical examiner who conducted the autopsy, Dr. Stephanie Erlich, her supervisor Dr. Eugene Carpenter, and Dr. David Chadwick,²¹⁵ a pediatric specialist in child abuse, all testified that the cause of death was SBS that tore or sheared portions of Etzel's brain stem, resulting in death.²¹⁶ These conclusions were supported by the autopsy and neuropathology findings discussed at trial and by the extensive medical literature referenced at trial and cited below.

*191 1. Testimony from the Medical Examiner Who Conducted Etzel's Autopsy--Dr. Erlich

(a) Dr. Erlich's Qualifications and Findings

Dr. Erlich, who was board certified in anatomic pathology and neuropathology²¹⁷ and was completing a one-year residency in forensic pathology,²¹⁸ conducted both the autopsy and neuropathology exam. Her autopsy examination revealed that Etzel had subdural hemorrhages and subarachnoid hemorrhages.²¹⁹ This bleeding was located diffusely: (1) between the two halves of his brain, (2) in the posterior fossa (i.e., at the base of his skull), and (3) on the under surface of his brain.²²⁰ Diffuse bleeding within the brain (i.e., bleeding located in multiple areas of the brain) is a hallmark of rotational injury to the head and is consistent with shaking, whereas focal hemorrhage (i.e., bleeding located in a single location) is characteristic of a focal impact trauma (i.e., injury resulting from a blow to the head or the head impacting against an object including injury potentially associated with a significant fall).²²¹

The autopsy also revealed older blood, which indicated an earlier brain injury that could have occurred days or weeks prior to his death.²²² Acute hemorrhages were also found in both optic nerve sheaths, as well as older blood in this region, again suggesting an earlier injury.²²³ The subdural hematoma was described as being relatively small in size, measuring between one and two tablespoons in volume.²²⁴ Both the Ninth Circuit and the Supreme Court dissenters would subsequently attach significance to this seemingly small volume of subdural blood.²²⁵ However, this reflects the Courts' ignorance of the fact that subdural fluid collections in AHT/SBS cases are typically small in volume.²²⁶ At trial, Dr. Erlich *192 also testified that there was no evidence of severe swelling of the brain at autopsy and that the brain had not herniated from swelling.²²⁷ This finding was consistent with Etzel experiencing a rapid death, before the brain had time to swell following trauma. Etzel's brain, however, did evidence some swelling indicating that some period of time elapsed between the initial trauma to his brain and his death.²²⁸

Dr. Erlich and another doctor also performed a neuropathological examination of Etzel's brain.²²⁹ That examination "confirmed the presence of fresh subarachnoid hemorrhages in the parietal, the occipital areas, the frontal areas, and in the left temporal area" of the brain.²³⁰ "They also confirmed the presence of fresh subdural hemorrhage in the parietal area, as well as an older subdural hemorrhage in the right parietal area."²³¹ Based on these findings, Dr. Erlich confirmed that the cause of death was "trauma to the brain."²³²

The autopsy also revealed a "recent small abrasion, approximately 1/16 by 3/16 of an inch, on [Etzel's] lower skull, upper neck region, and a recent bruise beneath this abrasion."²³³ The Ninth Circuit inaccurately understated the diagnostic importance of Etzel's scalp abrasion and underlying bruise when it opined that the "scalp abrasion was minimal, and was not even discovered until well into the autopsy."²³⁴ This bruise and abrasion clearly indicated that Etzel had sustained a blunt impact trauma to the head. Impact trauma to the head is frequently difficult to detect on visual inspection and may not be seen until the scalp is reflected during the autopsy.²³⁵ Accordingly, this evidence can be easily missed in children who do not die and are not autopsied.

*193 Dr. Erlich testified that she did not observe retinal hemorrhages at autopsy.²³⁶ Both the defense medical experts at Smith's trial and the Ninth Circuit emphasized the absence of retinal hemorrhages as a basis for their conclusion that Etzel did not sustain a shaking injury.²³⁷ But this opinion ignores the extensive medical literature establishing that retinal hemorrhages are not present in approximately 20% of AHT/SBS cases.²³⁸ As Dr. Erlich explained during her trial testimony, the lack of retinal hemorrhaging did not undermine her diagnosis because it had been well documented that retinal hemorrhages are not present in 15-30% of SBS cases.²³⁹

Dr. Erlich further explained that the fresh blood on Etzel's brain could not be the result of rebleeding from an earlier trauma nor could it have been caused by shaking after death.²⁴⁰ Dr. Erlich specifically stated that the medical literature cannot support the theory of rebleeding of chronic subdural hematomas in children.²⁴¹ Because minor trauma cannot cause a rebleed of a chronic subdural in infants,²⁴² the older blood on Etzel's brain represented prior trauma.²⁴³ This conclusion was further supported by the fact that the prior subdural was small, *194 avascular, and there was no mass effect from the prior bleeding to support a rebleed claim.²⁴⁴

(b) Dr. Erlich's Opinion Regarding Etzel's Cause of Death

Based on these findings, both Dr. Erlich and the supervising medical examiner, Dr. Carpenter, concluded that Etzel died as a result of head trauma attributed to SBS.²⁴⁵ Dr. Erlich indicated that the mechanism of death was the tearing of brain tissue and long nerve fibers within Etzel's brain and that bleeding over the brain's surface was a marker for this type of brain injury and mechanism.²⁴⁶ Later in her testimony, she indicated there were three mechanisms by which SBS causes death: (1) mass effects from subdural bleeding put pressure on the brainstem, (2) swelling of the brain causes herniation, or (3) direct trauma to the brainstem.²⁴⁷ Dr. Erlich noted that she did not submit sections of Etzel's brainstem for microscopic examination because injury would not be evident on microscopic examination if the child died quickly, and this would not have assisted in her diagnosis because the examiners "wouldn't have seen anything anyway."²⁴⁸ *195 Dr. Erlich also analogized this situation to adult patients who suffer strokes and die right away, noting that doctors will know clinically that the person had a stroke, but would not see changes in the neurons of the brain immediately, although they might have seen such changes if the person had instead survived for several hours.²⁴⁹ Today, more advanced staining techniques that might have identified the precise locations of Etzel's microscopic nerve tears are increasingly available to medical examiners and neuropathologists.²⁵⁰ However, at the time of his autopsy, Etzel's brain evidenced swelling indicating that some period of time elapsed between the initial trauma to his brain and his death.²⁵¹

The Ninth Circuit and the Smith dissenters concluded that the absence of direct evidence of microscopic tears in Etzel's brainstem demonstrated that there was no medical evidence of traumatic injury from shaking or impact trauma from which the jury could reliably determine guilt. On this critical point, the judges and justices were wrong--both legally and medically. Legally, both the expert witness testimony and the findings of blood markers for traumatic injury provided abundant evidence supporting the medical conclusions about the cause of Etzel's death. Moreover, this testimony was entirely consistent with the available medical evidence and literature both at the time of the trial and today.

In contrast, the six justices who joined in the Smith per curiam opinion correctly recognized that "[t]he Ninth Circuit's assertion that these [[prosecution] experts 'reached [their] conclusion because there was no evidence in the brain itself of the cause of death' is simply false."²⁵² These justices understood that the injury findings and medical opinions were medically consistent with AHT/SBS because "[t]he autopsy revealed indications of recent trauma to Etzel's brain, such as subdural and subarachnoid hemorrhaging, hemorrhaging around the optic nerves, and the presence of a blood clot between the brain's hemispheres" and these "affirmative indications of trauma formed the basis of the experts' opinion that Etzel died from shaking so severe that his brainstem tore."²⁵³ The justices also understood why direct evidence of injury to the brain tissue was not presented, noting that "the experts explained why the location of the tear was undetectable: 'Etzel's death happened so quickly that the effects of the trauma did not have time *196 to develop.' According to the prosecutions' experts, there was simply no opportunity for swelling to occur around the brainstem before Etzel died."²⁵⁴ Most importantly, they understood that the lack of evidence visualizing the location of these microscopic tears did not undermine the accuracy of the AHT/SBS diagnosis.

2. Testimony from the Supervising Medical Examiner, Dr. Carpenter

(a) Dr. Carpenter's Qualifications and Findings

Dr. Carpenter, a medical examiner board-certified in anatomic, clinical, and forensic pathology, who had performed 3,000 to 4,000 autopsies, agreed with Dr. Erlich that Etzel did not die from SIDS; he died from brain trauma.²⁵⁵ Dr. Carpenter explained that if his death had resulted from SIDS, there would have been no internal trauma, no bruises, and no abrasions.²⁵⁶

(b) Dr. Carpenter's Opinion Regarding Etzel's Cause of Death

Dr. Carpenter testified that the bleeding on top of Etzel's brain was caused by shaking so that "there was a whiplash action of the head on top of the body with the back of the head slamming into the back and the front of the head slamming into the chest repeatedly so that the vessels on the top of the brain tore."²⁵⁷ According to Dr. Carpenter, Etzel's "brain was so damaged from this violent shaking that death occurred relatively quickly, within . . . 30 minutes . . . [and] there was no significant delay between the shaking and the brain damage."²⁵⁸ As Dr. Carpenter explained, [T]here are two ways that . . . shaking to the head can cause death. One way is that the shaking itself is so severe that the brain tears in vital areas that control the heartbeat and the breathing. And then the bleeding can be small and won't amount to that much. The other way that a baby's body can die from shaking or from head trauma is for the vessels to tear, but for the brain not to be damaged that much. And for the blood to accumulate on top of the head. There is not enough room in the skull for *197 the brain and the blood. So the brain is pressed downward into the spinal canal and is crushed and th[en] dies.²⁵⁹

Dr. Carpenter explained that in Etzel's case there was not enough accumulation of blood to press the brain downward and cause death from pressure on the brain, so Etzel's death was caused by direct trauma to vital areas of the brain.²⁶⁰ Dr. Carpenter indicated that "he could not rule out the possibility of other blows to the head, but that there was no clear evidence of such blows except for the one small area of bruising" on Etzel's lower skull.²⁶¹

Dr. Carpenter could not rule out the possibility that a fall from the sofa could account for one of Etzel's injuries, the subdural hemorrhages.²⁶² But he also testified that Etzel's "injuries could not have been caused by the administration of CPR."²⁶³ Dr. Carpenter stated that retinal hemorrhages and fractures are often seen in infants who are shaken and Etzel had neither injury,²⁶⁴ and that it is possible for subdural hemorrhages and subarachnoid hemorrhages to occur as a result of birth trauma.²⁶⁵ However, the medical research on subdural and subarachnoid hemorrhages indicates that birth-related hemorrhages do sometimes occur but that they could not account for Etzel's injuries because they generally (1) are *198 asymptomatic, (2) resolve after one month, (3) do not result in sudden deterioration and collapse, and (4) cannot result in diffuse acute bleeding or bleeding in a different location in the brain.²⁶⁶

3. Testimony from the Child Abuse Expert Pediatrician--Dr. Chadwick

(a) Dr. Chadwick's Qualifications and Findings

In addition to Drs. Erlich and Carpenter, Dr. David Chadwick, a pediatrician specializing in abuse, also testified for the prosecution.²⁶⁷ Dr. Chadwick, who had been personally involved as a treating physician in fifty cases of SBS and AHT, half of which involved fatal outcomes, provided some of the most relevant and significant medical evidence.²⁶⁸ Thus, it is odd that the reviewing courts have consistently ignored his testimony. Like Drs. Erlich and Carpenter (and defense-retained witness Dr. Siegler), Dr. Chadwick ruled out the possibility that Etzel died from SIDS because, based on Etzel's other significant injuries, he did not have the requisite "negative autopsy" for a SIDS diagnosis.²⁶⁹

(b) Dr. Chadwick's Opinion Regarding Etzel's Cause of Death

Dr. Chadwick explained the precise mechanism of Etzel's death by describing how shaking infants creates acceleration and deceleration of the brain, which causes nerve fibers in the brain stem to tear.²⁷⁰ When these nerve fibers tear they cease to function and the brain undergoes major changes, including the interruption *199 of vital functions controlling breathing and heartbeat, which leads to death.²⁷¹ This injury mechanism was supported by evidence of the petechiae (spots caused by minor hemorrhaging) found in Etzel's lungs which indicated a disruption of Etzel's breathing mechanism and that he had been struggling to get air.²⁷²

With respect to the timing of the injury, a critical question for the jury, Dr. Chadwick testified that Etzel could not have sustained this type of injury, remained asymptomatic for hours, and then suddenly collapsed and died.²⁷³ Dr. Chadwick supported this conclusion with both his extensive clinical experience and the medical literature documenting that children with severe head trauma immediately become unconscious or comatose, although brain death may occur hours or even days later.²⁷⁴ Dr. Chadwick indicated there were many cases in which children *200 sustaining these types of injuries were dead on arrival at the hospital.²⁷⁵ Based on this evidence, he opined that Etzel's death had occurred very rapidly.²⁷⁶ Dr. Chadwick testified that if the injury is sufficient to cause the infant to stop breathing because it affects the vital centers, then the baby will die in five to ten minutes.²⁷⁷

Dr. Chadwick testified that the blood on Etzel's brain provided additional evidence of a traumatic injury.²⁷⁸ He also noted that his diagnosis was not undermined by the absence of retinal hemorrhages because these findings are not present in approximately 20% of AHT/SBS cases.²⁷⁹ Dr. Chadwick testified that Etzel's optic nerve hemorrhages were consistent with SBS and the older hemorrhage in the optic nerve likely indicated a prior occasion of similar injury.²⁸⁰ Dr. Chadwick also ruled out rebleeding from the older subdural hematoma as a cause for the acute blood in Etzel's head²⁸¹ and testified that a short fall from a sofa could not explain Etzel's fatal injuries.²⁸²

Dr. Chadwick explained that tears in an infant brain's nerve fibers are microscopic and difficult to locate during autopsy.²⁸³ But he strongly rejected the suggestion that because doctors could not locate these microscopic tears, they could not make a definitive cause of death determination.²⁸⁴ In his view, this same flawed logic should be compared to the (equally unsupportable) assumption that doctors cannot accurately diagnose cause of death for infants who die of overheating in cars because they do not present anatomic or physiological evidence that is specific to (can only be explained by) overheating.²⁸⁵ Finally, Dr. Chadwick clarified that Etzel's lack of neck injuries did not undermine his diagnosis because neck injuries are identified in only 10% of AHT/SBS cases.²⁸⁶

***201 4. Testimony from Defense-Retained Witness--Dr. Siegler**

(a) Dr. Siegler's Qualifications and Findings

The defense called two experts at trial.²⁸⁷ The first expert, Dr. Richard Siegler, a forensic pathologist,²⁸⁸ agreed that Etzel did not die from SIDS but died from brain trauma.²⁸⁹ The California Court of Appeal described Dr. Siegler's qualifications as follows:

On voir dire, the prosecutor established that Dr. Siegler's extensive experience was not in forensic pathology, but in general, clinical and anatomic pathology. Ninety-five percent of his publications ha[d] been on cancer. He had not authored any articles dealing with child abuse or forensic pathology in determining the causes of death in infants. Although he had been a medical examiner in Philadelphia in 1960, shaken baby syndrome was unknown at that time. He had not been involved in any autopsies where the cause of death was found to be shaken baby syndrome. He had performed 50 autopsies on children with brain trauma over the last 25 years.²⁹⁰

(b) Dr. Siegler's Opinion Regarding Etzel's Cause of Death

In Dr. Siegler's view, Etzel's death was not caused by shaking because there were no retinal hemorrhages.²⁹¹ As discussed above, Dr. Siegler's testimony is not supported by the medical evidence introduced at trial or the medical literature. The absence of retinal hemorrhages does not preclude a diagnosis of shaking or AHT because, as numerous researchers have documented, retinal hemorrhages are not present in approximately 20% of AHT/SBS cases.²⁹² Moreover, as Dr. Siegler subsequently acknowledged from the witness stand, the absence of retinal hemorrhages cannot exclude a diagnosis of SBS.²⁹³

Dr. Siegler testified that Etzel's brain trauma did not happen shortly before his death because he did not see evidence of a fresh trauma.²⁹⁴ The Ninth Circuit inexplicably misstated Dr. Siegler's testimony on this vital point. According to the appellate court, Dr. Siegler opined that Etzel must have died from the lingering effects of earlier brain trauma of unknown but quite possibly innocent cause.²⁹⁵ ***202** This is not an accurate description of Dr. Siegler's testimony. A review of the transcript of Dr. Siegler's testimony reveals that his opinions pertaining to "older trauma" were based on the presence of the older subdural hemorrhages, which he (mistakenly) described as broadly present (i.e., diffuse) in Etzel's brain.²⁹⁶ As noted above, the older subdural hemorrhages found in Etzel's brain were not diffuse, but were instead focal (confined to one area of the brain). It is clear from the trial transcript that Dr. Siegler could not account for the diffuse acute (fresh) hemorrhages described in the neuropathology report and diagrammed by Dr. Erlich at trial. Thus, the Ninth Circuit's speculation that Etzel likely died from older brain trauma of "possibly innocent" origin is unsupported by Dr. Siegler's testimony or any other medical evidence presented at trial, or any medical literature.²⁹⁷

Finally, although both the Ninth Circuit and the Smith dissenters ignored this fact, Dr. Siegler conceded that his medical opinions were based solely on photographs taken by the neuropathologist.²⁹⁸ He also admitted that he had not even considered the evidence presented by Dr. Erlich and Dr. Carpenter--which showed extensive fresh bleeding to Etzel's brain--in reaching his conclusion that there was no medical evidence of fresh trauma.²⁹⁹

5. Testimony from the Defense-Retained Witness--Dr. Goldie

(a) Dr. Goldie's Qualifications and Findings

The defendant's second expert, Dr. William Goldie, a pediatric neurologist, disagreed with all of the other experts and testified that Etzel's death was due to SIDS.³⁰⁰ According to Dr. Goldie, jaundice, a heart murmur, and low birth weight were all factors that made Etzel predisposed to a SIDS death.³⁰¹ Without support from the medical evidence or the medical literature and in contrast to the other *203 experts, Dr. Goldie opined that some of the acute bleeding on Etzel's brain was the result of CPR³⁰² and that, in the alternative, premature infants sometimes bleed into their heads without cause.³⁰³

(b) Dr. Goldie's Opinion Regarding Etzel's Cause of Death

Dr. Goldie, who was not board certified in neuropathology, clinical pathology or forensic pathology, concluded that the pathologists had inaccurately determined the cause of Etzel's death³⁰⁴ because, in his opinion, SBS can only be diagnosed based on a finding of either massive brain bleeding or massive brain swelling (at least when the brain stem does not show damage).³⁰⁵

The medical evidence presented at trial and the medical literature all contradict Dr. Goldie's opinion. First, massive brain bleeding is not a valid diagnostic criterion for AHT/SBS. The volume of blood in these cases is typically small, one to two tablespoons, just as in Etzel's case.³⁰⁶ Second, Dr. Goldie's testimony on brain swelling ignores the medical evidence indicating that Etzel died from injury to his brain stem that disrupted the respiratory center of his brain and the fact that because the brain stops swelling when a child dies, the lack of swelling is medically consistent with brain death occurring shortly after injury.³⁰⁷

E. The Smith Dissenters Interpret the Evidence

1. The Dissenters' Misguided Concern that Etzel's Injury Could not be Located

According to Justice Ginsburg, "[w]hat is now known about SBS casts grave doubt on the charge leveled against Smith."³⁰⁸ In addition to this inaccurate general assessment of the current state of medical knowledge, the dissenters reviewed the specific medical evidence presented by the five experts who testified at the Smith trial and inaccurately concluded that "[f]ew of the[] signs of SBS were present here."³⁰⁹ This assumption echoes the Ninth Circuit's mistaken finding that the jury based its verdict on the opinions of medical experts who had improperly "reached [their] conclusion because there was no evidence in the brain itself of the cause of death."³¹⁰

*204 The Smith dissenters begin with the complaint that the "autopsy revealed no physical evidence of such injury, either grossly or microscopically," that "Dr. Carpenter was unable to state which particular areas of the brain were injured, and the neuropathologist found no evidence of specific brain injury," that "[n]o doctor located any tear," and that "the examining physicians did not cut open Etzel's brainstem, or submit it to neuropathology."³¹¹

Justice Ginsburg's concerns illustrate how courts can adopt and then advance a profound misunderstanding of the medical evidence presented at trial in AHT/SBS cases. First, there was no gross physical evidence of the tears to Etzel's brain because

they were too small to see and occurred at a microscopic level.³¹² Second, the pathologists who conducted Etzel's autopsy did not section his brain for microscopic examination because this procedure would not have helped them "locate[] any tear."³¹³ As Dr. Erlich stated at trial, dissection was not necessary because, given the techniques available at the time, they "wouldn't have seen anything anyway."³¹⁴ In fact, Dr. Chadwick described the advent of new staining techniques with the capacity to reveal this type of brainstem damage, but noted that at the time of Etzel's autopsy they were not yet widely available.³¹⁵ Etzel did not survive long enough for changes to his brain to become detectable using standard techniques,³¹⁶ despite the fact that the bleeding around his brain clearly indicated injury to the brain itself.³¹⁷

*205 Although the Smith dissenters appear confused on this point, the fact that the doctors who performed Etzel's autopsy in 1996 could not visualize the microscopic tears that caused Etzel to stop breathing does not mean, as the Ninth Circuit asserted, that "there was no evidence . . . of the cause of death."³¹⁸ This argument is both illogical and unscientific. It is akin to asserting that the advent of a new medical technology enabling physicians to more accurately pinpoint the location of a microscopic injury undermines the validity of all previous diagnoses. Physicians have a long and widely known history of accurately diagnosing a range of diseases that only recently can be visualized using new imaging and diagnostic technologies. The argument also fails as a matter of basic science. Diseases can be diagnosed, and even cured, without a precise understanding of the entire disease process. To cite just one famous example, scurvy was first described by Hippocrates.³¹⁹ By the mid-eighteenth century, the disease was successfully treated with fresh food (particularly citrus fruit).³²⁰ The discovery of vitamin C deficiency as the precise biological disease mechanism did not occur until 1932.³²¹

2. The Dissenters' Five Specific Concerns Regarding the Medical Evidence

In addition to their specific concern that Etzel's brain tears could not be visualized, the Smith dissenters list five general problems with the medical evidence that, in their view, "cast grave doubt" on the accuracy of the jury verdict. Because these general concerns will likely be repeated by defense-retained medical witnesses, counsel, and judges in future AHT/SBS cases, each will be evaluated below.

(a) "Etzel's Subdural Hemorrhage and Subarachnoid Hemorrhage Were Minimal"³²²

This statement, although technically accurate, cannot undermine the validity of the AHT/SBS diagnosis and reflects a lay misunderstanding of the mechanism of AHT injuries. The autopsy revealed that Etzel had subdural hemorrhages³²³ and subarachnoid hemorrhages³²⁴ located between the two halves of his brain in the posterior fossa (i.e., at the base of his skull) and on the under surface of his brain.³²⁵ The autopsy also revealed older blood, which indicated an earlier brain injury that could have occurred days or weeks prior to his death.³²⁶ Acute *206 hemorrhages were also found in both optic nerve sheaths, as well as older blood in this region, again suggesting an earlier injury.³²⁷

Etzel's subdural and subarachnoid hemorrhages were described as being small in size, measuring between one and two tablespoons in volume.³²⁸ But as Dr. Erlich explained, subdural bleeding in AHT cases need not manifest as large, mass effect collections of blood that put pressure on the brain and lead to death.³²⁹ Instead, the presence of such blood acts as a "marker" for a specific mechanism of traumatic brain injury--the rotational acceleration-deceleration of the head and brain.³³⁰ This injury mechanism tears bridging veins causing the bleed and concurrently causing direct injury to the brain tissue but does not result in significant bleeding.³³¹ This is consistent with the extensive medical literature and Dr. Carpenter's testimony explaining that Etzel's death was caused by "direct trauma to vital areas of the brain."³³²

(b) "There Was No Brain Swelling"³³³

This statement reflects a fundamental misunderstanding of how shaking can cause infant death. At trial, Dr. Carpenter specifically testified that shaking can cause death in different ways.³³⁴ First, shaking can create a large bleed that creates *207 pressure on the brain causing the brain to herniate. But another way is that “the shaking is so severe that the brain tears in vital areas that control the heartbeat and the breathing.”³³⁵ As noted above, Dr. Carpenter, Dr. Erlich, and Dr. Chadwick all agreed that the mechanism of Etzel's death was the tearing of brain tissue and long nerve fibers within his brain and that bleeding over the brain's surface was a marker for this type of brain injury.³³⁶ Thus, Etzel died from injury to the brain stem that disrupted the respiratory center of his brain. Because extensive medical evidence supports the finding that the brain stops swelling when the child dies, the lack of brain swelling is medically consistent with brain death occurring shortly after injury³³⁷ and Dr. Chadwick testified that Etzel's death had occurred very rapidly.³³⁸ According to Dr. Chadwick, if the injury is sufficient to cause the infant to stop breathing because it affects the vital centers, the baby can die in five to ten minutes.³³⁹

(c) “There Was . . . No Retinal Hemorrhage in Either Eye”³⁴⁰

This concern is likely derived from Dr. Siegler's testimony that Etzel's death was not caused by shaking because there were no retinal hemorrhages.³⁴¹ The lack of retinal hemorrhages in one of every five AHT/SBS cases itself establishes that this finding cannot undermine the abuse diagnosis.³⁴² Because this fact was well known at the time, presented at trial, and even conceded by Dr. Siegler,³⁴³ it is difficult to understand why both the Ninth Circuit and the Smith dissenters ignored it.

*208 (d) “[A]bsent Were Any Fractures, Sprains, Bleeding in the Joints, or Displacement of the Joints”³⁴⁴

This statement cannot undermine the validity of any AHT/SBS diagnosis. None of these different types of injuries are diagnostic criteria for AHT/SBS. The medical evidence further reveals that it is not uncommon for infants suffering from AHT/SBS to present without other musculoskeletal injuries.³⁴⁵

(e) “A ‘Tiny’ Abrasion on the Skin and a Corresponding Bruise Under the Scalp Did Not Produce Brain Trauma”³⁴⁶

This concern is likely derived from Ninth Circuit dicta opining that Etzel's “scalp abrasion was minimal and was not even discovered until well into the autopsy”³⁴⁷ and, in their view, insufficient to have caused his death. This comment inaccurately understates the diagnostic importance of Etzel's scalp abrasion and underlying bruise. A child of Etzel's age should not have any scalp injuries. Any abrasions or contusions (both were present here) are significant findings because they provide evidence indicating that the child was not merely shaken but also impacted.³⁴⁸ Any evidence of impact injuries is especially important in AHT/SBS cases because medical research shows that impact magnifies the forces to the infant brain anywhere from ten to fifty fold, making the injury that much greater.³⁴⁹

The medical evidence contradicts the Smith dissenters' suggestion that small abrasions and contusions cannot contribute to brain trauma. In this case, Dr. Carpenter specifically ruled out the possibility that a fall from the sofa could account for the traumatic injuries to Etzel's head.³⁵⁰ He also testified that Etzel's injuries could not have been caused by the administration of CPR.³⁵¹ On this point, *209 the Ninth Circuit's concern that these findings were “discovered well into the autopsy” is equally unpersuasive. Impact trauma to the head is frequently difficult to detect on external visual inspection. In fact, this evidence can be easily missed in children who do not die, because these lesions are best visualized during autopsy because the scalp is revealed.³⁵²

Thus, there is no evidence-based reason for the Smith dissenters to have concluded that all or any of these five medical questions cast doubt on the accuracy of the jury verdict.

IV. Conclusion: How the "Tail Wags the Dog" on Post-Conviction Review

A. The Legal Standard

1. The Smith Per Curiam Opinion and the Legal Standard

The legal standard for appellate review of state court convictions is abundantly clear. It is, of course, the responsibility of the jury and not the appellate court to draw conclusions based on the evidence presented at trial.³⁵³ A reviewing court "may set aside the jury's verdict on the ground of insufficient evidence only if no rational trier of fact could have agreed with the jury."³⁵⁴ Moreover, when reviewing a decision from a state court rejecting a sufficiency of the evidence challenge, the federal court may only overturn if the state court decision was "objectively unreasonable."³⁵⁵ Under the review standard from the Antiterrorism and Effective Death Penalty Act of 1996, a writ of habeas corpus on behalf of a person in custody pursuant to the judgment of a State court shall not be granted with respect to any claim that was adjudicated on the merits in State court proceedings unless the adjudication of the claim . . . resulted in a decision that was contrary to, or involved an unreasonable application of, clearly established Federal law, as determined by the Supreme Court of the United States.³⁵⁶

The Ninth Circuit had no power to afford habeas relief unless Smith could demonstrate that the California Court of Appeals decision affirming her conviction *210 "was contrary to, or involved an unreasonable application of, clearly established federal law as reflected in the holdings of th[e] [[Supreme] Court's cases."³⁵⁷

The six justices who joined the Smith per curiam decision correctly held that in granting habeas relief, the Ninth Circuit improperly ignored "the plentitude of expert testimony in the trial record concluding that sudden shearing or tearing of the brainstem was the cause of Etzel's death."³⁵⁸

The Ninth Circuit's assertion that these [prosecution] experts "reached [their] conclusion because there is no evidence in the brain itself of the cause of death" is simply false. There was "evidence in the brain itself." The autopsy revealed indications of recent trauma to Etzel's brain, such as subdural and subarachnoid hemorrhaging, hemorrhaging around the optic nerves, and the presence of a blood clot between the brain hemispheres. The autopsy also revealed a bruise and abrasion on the lower back of Etzel's head. These affirmative indications of trauma formed the basis of the experts' opinion that Etzel died from shaking so severe that his brainstem tore.³⁵⁹

Thus, Smith's conviction was not objectively unreasonable.³⁶⁰

2. The Smith Dissent and the Legal Standard

Justice Ginsburg, writing for the three dissenters, did not focus on the governing legal standard when she opined that the Supreme Court erroneously granted California's petition for review. As shown above, she also did not focus on the extensive medical and nonmedical evidence presented at trial.³⁶¹

*211 The dissenters apparently based their decision, at least in part, on a series of assumptions excerpted from the 2004 opinion of the Federal Magistrate Judge who had originally denied Smith's habeas corpus petition. These included the following: (1) "Grandmothers, especially those not serving as the primary caretakers, are not the typical perpetrators [in shaken baby cases];"³⁶² (2) Smith "was helping her daughter raise her other children;"³⁶³ (3) there was "no hint of [Smith] abusing or

neglecting these other children,”³⁶⁴ (4) there was “no evidence of any precipitating event that might have caused [Smith] to snap and assault her grandson;”³⁶⁵ (5) Smith “was not trapped in a hopeless situation with a child she did not want or love[;] [n]or was she forced to single-handedly care for a baby that had been crying all day and all night;”³⁶⁶ (6) there was “no evidence that Etzel was doing anything other than sleeping the night he died;”³⁶⁷ (7) “Etzel’s mother[] was in the room next door when Etzel died;”³⁶⁸ (8) “[T]he medical evidence was not typical”³⁶⁹ These emotionally appealing, but speculative and even irrelevant, assumptions provide significant insight into the dissenters’ skewed jurisprudential approach. There are lingering questions after any case is decided. However, the federal magistrate who created this list, the Ninth Circuit that parroted it, and the three Supreme Court Justices who featured it in their decision, cannot plausibly argue that any or all of these assumptions demonstrate that Smith’s conviction was objectively unreasonable.

However, Justice Ginsburg relies on these assumptions to make a strange and very different argument. In the dissenters’ view, Smith is a “tragic” case.³⁷⁰ The death of a seven week-old child is always tragic. But Etzel’s death does not appear to be the focus of the Justices’ concern. In the next sentence, they reveal their belief that the only thing the Court has achieved by reviewing this decision from the Ninth Circuit is “to prolong Smith’s suffering and her separation from her family.”³⁷¹ According to Justice Ginsburg, not only has Smith suffered enough, but she is a loving grandmother who “poses no danger whatever to her family or anyone else in society.”³⁷² Returning Smith, who “the evidence indicate[s] . . . [is] warm hearted, sensitive, and gentle,” to prison will be “depriving Smith of the liberty she currently enjoys, and her family of her care.”³⁷³ Given the extensive inculpatory medical and nonmedical evidence presented at trial, the dissenters’ *212 unusual, extensive, and unsupported commentary regarding Smith’s good character during postconviction review merits careful consideration.

(a) Postconviction Distortion of the Medical and Nonmedical Evidence

An unfortunate reality of the postconviction review process is that pertinent facts from the trial record are often lost, ignored, distorted, taken out of context, or omitted as the case is presented in later hearings. In some cases, decreased judicial reliance on the facts may be appropriate, especially where the facts have little bearing on the legal analysis. However, in child abuse and child homicide cases, like Smith, problems arise as multiple layers of appeals move the courts further from the relevant facts.

At every level of appeal, the critical issue in Smith was the defendant’s claim that there was insufficient evidence of her guilt.³⁷⁴ This claim pertains to both the sufficiency of the medical evidence regarding the victim’s cause of death and the nonmedical evidence implicating the defendant’s acts as the cause of the victim’s fatal injuries.³⁷⁵ Because child abuse and child homicide cases invariably require judges and juries to examine these different types of evidence, we offer four corrections to the approach adopted in this case. These corrections elucidate how the dissenters’ distorted review of the record resulted in their legally and factually inaccurate conclusions. They also anticipate and may help prevent similar inaccurate evidentiary evaluations in future AHT/SBS cases.

(i) Empathy

Empathy for the defendant based on a reviewing court’s selective reading of the evidence is improper and antithetical to the deference owed the trial jury. The Smith dissenters’ speculations about the defendant (e.g., that she was generously helping to raise Etzel) or about grandmothers in general simply have no bearing on the only relevant legal question--whether it was unreasonable for the jury to have concluded (based on the medical and nonmedical evidence) that Smith had assaulted Etzel “by means of force that to a reasonable person would be likely to produce great bodily injury.”³⁷⁶

The Justices’ unusual approach may help explain the omission of the bulk of the inculpatory evidence contained in the trial record and their argument (despite the clear habeas standard) that the Court should have simply refused to review the *213 Ninth Circuit decision.³⁷⁷ As the Court correctly--and presciently--recognized, the dissenters may believe “that Smith, who already

has served years in prison, has been punished enough, and that she poses no danger to society[,] [t]hese or other considerations perhaps would be grounds to seek clemency," but are not grounds for overturning the jury verdict in this case.³⁷⁸

(ii) Preferring the Nonmedical Evidence

As the Smith Court observed, the jury heard extensive medical evidence that "Etzel died from shaking so severe that his brain stem tore"³⁷⁹ and that this must have occurred while he was in the defendant's care. In the face of this evidence, the dissenters concluded that Smith is a "warm-hearted," "sensitive," "gentle," and "loving" grandmother. This suggests that the dissenters discounted the complex medical evidence and focused instead on the simple (although far from entirely) exculpatory nonmedical testimony from Smith's relatives and the fact that the defendant was never previously charged with (or apparently even suspected of) physically abusing Etzel. Not only are these assumptions contradicted by the trial record, but it is an obvious logical fallacy to assume that a suspect was wrongfully convicted simply because she does not represent the stereotypical "majority" of offenders for a particular crime or because she has never been prosecuted or suspected of this crime in the past.

Although there have been some studies of the statistical profile of AHT/SBS offenders,³⁸⁰ the data tells us nothing about whether Smith shook her grandson hard enough on the night of November 29, 1996, to critically injure his brain. Moreover, as the dissenting Justices must be aware, child abuse is almost invariably committed by parents and caregivers who have displayed gentle and *214 loving behavior towards the same children at other times.³⁸¹ The assumption that a grandmother could not harm a child simply because she is a grandmother or because she has previously behaved gently is unsupportable.³⁸² Finally, Smith's clean record also tells us nothing about her culpability. Child abuse is a crime frequently committed by caretakers who lack any prior criminal history, but who lose control during single or isolated episodes of violent conduct.³⁸³ As all of the judges who have reviewed this case on appeal were well aware, evidence of Smith's violent temperament or prior bad conduct, if such evidence existed, would have been excluded from trial under the state rules barring propensity evidence.³⁸⁴

(iii) Ignoring the Obvious and Relying on the Straw Man Argument

During their review of the medical and nonmedical evidence, the dissenters ignored the fact that Etzel was only seven weeks old and spent his brief life in a home surrounded by other relatives. The close proximity of other relatives may have insulated Etzel from other abusive acts because child abuse typically occurs *215 when a caregiver is left alone with a child.³⁸⁵ While the dissenters use the fact that Etzel did not have any fractures or sprains as a straw man to suggest that Smith could not have shaken Etzel because she did not inflict other types of injuries, this argument cannot be sustained.³⁸⁶

The lack of physical evidence of different types of abusive injuries is both unsurprising, in this case, and well documented in the child abuse literature.³⁸⁷ The dissenters' concern about the lack of other types of abusive injuries also ignores the fact that the medical evidence did show that Etzel had suffered similar injuries in the past. Etzel's autopsy revealed an earlier brain injury and older optic nerve bleeding, which clearly indicated prior head trauma. These findings were not disputed by the defendant's experts.³⁸⁸ No evidence was presented at trial to establish that Smith was not in a position to have caused this prior trauma.

(iv) Discounting the Inculpatory Nonmedical Evidence

According to Justice Ginsburg, the nonmedical evidence offered by the prosecution was "meager" because (1) "[t]here was no evidence whatever that Smith abused her grandchildren in the past or acted with any malicious intent on the night in question";³⁸⁹ (2) there was no "motive or precipitating event that might have led Smith to shake Etzel violently";³⁹⁰ (3) there was no "evidence [that] showed that Etzel was crying in the hours before he died";³⁹¹ and (4) "[a]ny loud crying likely would have woken Etzel's siblings, Yondale, age 14 months, and Yolanda, age 4, asleep only feet away, even Etzel's mother, Tomeka, asleep in the neighboring room."³⁹² As shown above, these speculations are not just a distortion of the record, they are legally

irrelevant because the defendant was convicted *216 under a California child abuse statute that specifically does not require proof of motive or malicious intent.³⁹³

The dissenters' skewed jurisprudential approach to the nonmedical evidence is best illustrated by their treatment of the defendant's multiple admissions that she shook or "jostled" Etzel immediately before he died. According to Justice Ginsburg, Smith's admission that she had given Etzel "a little shake, a jostle to awaken him" and then asked, "'Oh, my God. Did I do it? Did I do it? Oh, my God,'" "cannot be equated to a confession of guilt." While Smith's admission is strongly suggestive of her guilt, and likely was understood as inculpatory by the jury, Justice Ginsburg opines that "[g]iving a baby 'a little shake, a jostle to wake him'" cannot be "an admission to shaking a child violently, causing his brainstem to tear."³⁹⁴

This conclusion is remarkable for several reasons. First, the dissenters claim the almost supernatural ability to determine (without citation to a single source) that what the perpetrator has described as "a little shake" cannot possibly result in traumatic head injury. Second, the dissenters ignore the legal standard, which requires that they take the evidence in the light most favorable to supporting the jury's conviction, that is, that the jurors could have found that the defendant had admitted the specific mechanism of traumatic injury while simultaneously attempting to minimize the severity of her actions. Third, the dissenters ignore readily available medical research establishing that perpetrators often initially provide false information regarding how abusive injuries occurred.³⁹⁵ As the three dissenting Justices must know, perpetrators who make admissions frequently minimize the force or violence associated with their conduct.

The dissenters take a similarly dismissive approach, or simply ignore, the following additional inculpatory nonmedical evidence: (1) the undisputed fact that the defendant was the only adult in the living room with Etzel from midnight until he stopped breathing; (2) the evidence that Etzel was asymptomatic prior to the time the defendant was left alone with him; (3) the defendant's statement that Etzel fell off the couch, a claim that is developmentally unlikely for a seven-week-old infant; (4) the defendant's conflicting statements to the social worker and to the police; (5) testimony from the social worker that the defendant demonstrated shaking Etzel; and (6) evidence that Tomeka, Etzel's mother, accused the defendant of causing Etzel's death during the interview with the social worker.³⁹⁶

*217 (b) Preventing Future Courts from Making Similar Mistakes

Justices Ginsburg, Breyer, and Sotomayor are apparently convinced that "[w]hat is now known about SBS casts grave doubt on the charge leveled against Smith"³⁹⁷ in this case and more generally that "[d]oubt has increased in the medical community 'over whether infants can be fatally injured through shaking alone.'" ³⁹⁸ As the foregoing review of the medical and nonmedical evidence demonstrates, appellate court conclusions in child abuse and child homicide cases may be based on a distorted analysis of the record and, as we discuss in a companion article,³⁹⁹ an equally skewed and inaccurate review of the medical literature.

The Smith dissenters' myopic view of the evidence muddies their analysis of the legal and scientific questions and raises real concerns about the message sent to future courts, the media, and the public. Viewed most charitably, the opinion may reflect an empathetic rejection of the horrifying notion that anyone capable of being a loving grandmother could lose control once and shake her infant grandson hard enough to cause his death. However, the Smith dissent is dangerous because it appears to add legitimacy to the false AHT/SBS controversy, which continues to gain traction despite its lack of empirical or clinical support.⁴⁰⁰ Left uncorrected and misunderstood, these problems will make it harder for judges and juries to focus on the medical evidence and reach accurate verdicts. Outside the courthouse, we hope to prevent these decisions from promulgating misinformation about how infants can be injured or killed by shaking that directly threatens vital public health and child abuse prevention, investigation, and prosecution efforts.⁴⁰¹

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

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1 See generally Leah Ceccarelli, *Manufactured Scientific Controversy: Science, Rhetoric, and Public Debate*, 14 *Rhetoric & Pub. Affairs* 195 (2011) (discussing the false "manufactured" controversies of global warming skepticism, dissent over AIDS being caused by HIV, and intelligent design); see also *Understanding Evolution*, Univ. Cal. Museum Paleontology, <http://evolution.berkeley.edu> (last visited Mar. 10, 2013) (discussing the false "scientific controversy" of intelligent design versus evolution); Vaccine Safety, Center for Disease Control & Prevention, <http://www.cdc.gov/vaccinesafety> (last visited Mar. 10, 2013) (discussing the false "scientific controversy" regarding whether childhood vaccines can cause autism). As Professor Susan Haack has observed:

At any time there is a whole continuum of scientific ideas, claims, and theories: some so well-warranted by such strong evidence that it is most unlikely they will have to be revised; some not quite so well-warranted but still pretty solidly established; some promising but as yet far from certain; some new and exciting but highly speculative and as yet untested; and some so wild that few mainstream scientists are willing even to listen to them. (The proportion of the well-warranted to the highly-speculative varies, obviously, across fields and sub-fields.) A few of the exciting but as yet untested ideas, and a very, very few of the wildest ideas, will eventually turn out to be warrantable; but most will not.

Susan Haack, *Of Truth, in Science and in Law*, 73 *Brook. L. Rev.* 985, 996-97 (2008).

2 See generally Michael Specter, *Denialism: How Irrational Thinking Hinders Scientific Progress, Harms the Planet, and Threatens Our Lives* (2009) (describing the phenomenon of denialism and discussing its dangers); Martin McKee & Pascal Diethelm, *How the Growth of Denialism Undermines Public Health*, 341 *BMJ* 1309, 1310 (2010) (noting that "denialism" in the medical arena is characterized by several features, including (a) "[i]dentification of conspiracies," (b) "use of fake experts," (c) "selectivity of citation," (d) "[c]reation of impossible expectations of research," (e) "[m]isrepresentation and logical fallacies," and (f) "[m]anufacture of doubt"). Denialism and, more specifically, explorations of manufactured "scientific controversies" such as Professor Ceccarelli's work, *supra* note 1, at 195, provide generally useful tools for understanding much of the specific scientific, pseudoscientific, and legal academic information discussed below.

3 See McKee & Diethelm, *supra* note 2, at 1309.

4 Ceccarelli, *supra* note 1, at 196 (emphasis added).

5 *Id.* at 197.

6 132 S. Ct. 2 (2011) (*per curiam*).

7 *Id.* at 8. The relevant statute provides, "Any person who, having the care or custody of a child who is under eight years of age, assaults the child by means of force that to a reasonable person would be likely to produce great bodily injury, resulting in the child's death, shall be punished by imprisonment" Cal. Penal Code § 273ab (West 2008).

8 The original articles commenting on SBS were published in the early 1970s. See John Caffey, *On the Theory and Practice of Shaking Infants: Its Potential Residual Effects of Permanent Brain Damage and Mental Retardation*, 124 *Am. J. Diseases Child.* 161 (1972); John Caffey, *The Whiplash Shaken Infant Syndrome: Manual Shaking by the Extremities with Whiplash-Induced Intracranial and Intraocular Bleedings, Linked with Residual Permanent Brain Damage and Mental Retardation*, 54 *Pediatrics* 396 (1974); A.N. Guthkelch, *Infantile Subdural Haematoma and Its Relationship to Whiplash Injuries*, 759 *BMJ* 430 (1971). Over the past four decades, AHT/SBS has been well documented in the peer-reviewed medical literature. The research supporting this diagnosis includes (1) two medical treatises, (2) at least fourteen chapters in other medical treatises, (3) over seven hundred peer-reviewed clinical medical articles published by over one thousand medical authors from at least twenty-eight countries, (4) at least eight systematic reviews of the medical literature, (5) at least fifteen controlled trials, (6) at least fifty comparative cohort studies or prospective case series, and (7) numerous well-designed retrospective case series/reports comprising thousands of cases. Sandeep Narang, *A Daubert Analysis of Abusive Head Trauma/Shaken Baby Syndrome*, 11 *Hous. J. Health L. & Pol'y* 505, 538-40 (2011).

9 See, e.g., *Child Abuse: Medical Diagnosis & Management* (Robert M. Reece & Cindy W. Christian eds., 3d ed. 2009); Lori Frasier et al., *Abusive Head Trauma in Infants and Children: A Medical, Legal, and Forensic Reference* (Karen C. Maurer et al. eds., 2006); James A. Monteleone, *Child Maltreatment: A Clinical Guide and Reference* (2d ed. 1998); *Inflicted Childhood Neurotrauma* (Robert

DISSENT INTO CONFUSION: THE SUPREME COURT,..., 2013 Utah L. Rev. 153

M. Reece & Carol E. Nicholson eds., 2003); *The Shaken Baby Syndrome: A Multidisciplinary Approach* (Stephen Lazoritz & Vince Palusci eds., 2001); *Shaking and Other Non-Accidental Head Injuries in Children* (Robert A. Minns & J. Keith Brown eds., 2005); Mark S. Dias, *The Case for Shaking, in Child Abuse and Neglect: Diagnosis, Treatment, and Evidence* 364 (Carole Jenny ed., 2010).

- 10 See Sharyn E. Parks et al., *Ctr for Disease Control & Prevention, Pediatric Abusive Head Trauma: Recommended Definitions for Public Health Surveillance and Research* (2012), available at [http:// www.cdc.gov/ViolencePrevention/pdf/PedHeadTrauma-a.pdf](http://www.cdc.gov/ViolencePrevention/pdf/PedHeadTrauma-a.pdf).
- 11 See cases cited *infra* notes 47, 71; see also John E.B. Myers, *Myers on Evidence of Interpersonal Violence: Child Maltreatment, Intimate Partner Violence, Rape, Stalking, and Elder Abuse* (5th ed. 2011) (discussing the issues surrounding expert medical testimony in this arena and citing numerous cases as examples).
- 12 Smith, 132 S. Ct. at 4. For interesting speculations regarding *Cavazos v. Smith* in the context of the Supreme Court's tendency to distrust the Ninth Circuit, see Vikram David Amar, *The Supreme Court's First Ruling of the New Term, Cavazos v. Smith: Supreme Court Annoyance, the Ninth Circuit, and Summary Reversals, Verdict* (Nov. 11, 2011), [http:// verdict.justia.com/2011/11/11/the-supreme-courts-first-ruling-of-the-new-term-cavazos-v-smith](http://verdict.justia.com/2011/11/11/the-supreme-courts-first-ruling-of-the-new-term-cavazos-v-smith).
- 13 Smith, 132 S. Ct. at 9 (Ginsburg, J., dissenting)
- 14 *Id.*, at 9-10 (Ginsburg, J., dissenting) (quoting *State v. Edmunds*, 746 N.W.2d 590, 596 (Wis. Ct. App. 2008)).
- 15 This Article refers to AHT/SBS because the American Academy of Pediatrics has recently revised its own position paper on SBS to be more inclusive of the multiple mechanisms by which AHT may be inflicted. See Cindy W. Christian & Robert W. Block, *Abusive Head Trauma in Infants and Children*, 123 *Pediatrics* 1409, 1409-11 (2009) (setting forth the American Academy of Pediatrics (AAP) position and noting that the Academy determined it was necessary to modify the terminology for describing inflicted head trauma to recognize the multiple mechanisms by which the spectrum of injuries could be inflicted, including shaking, impact, a combination, and additional mechanisms). Contrary to the representations made by many defense-retained witnesses and legal academic commentators, the 2009 position statement does not do away with shaking as a mechanism of injury but reaffirms it. According to the AAP, "Shaken baby syndrome is a subset of AHT. Injuries induced by shaking and those caused by blunt trauma have the potential to result in death or permanent neurologic disability" and "[t]he goal of this policy statement is not to detract from shaking as a mechanism of AHT but to broaden the terminology to account for the multitude of primary and secondary injuries that result from AHT" *Id.* at 1409-10; see also Stephen Lazoritz et al., *The Whiplash Shaken Infant Syndrome: Has Caffey's Syndrome Changed or Have We Changed His Syndrome?*, 21 *Child Abuse & Neglect* 1009, 1010-13 (1997) (suggesting that in 1997 Dr. Caffey's terminology and diagnostic criteria for "Whiplash Shaken Infant Syndrome" should be changed to encompass broader understandings of the mechanisms of injury based on medical research on the syndrome over the past twenty-five years).
- 16 This conclusion might logically follow because no amicus briefs were filed in the Supreme Court and only one of the articles relied upon by the dissenters was cited in the defendant's brief, suggesting that the dissenters conducted an independent analysis of the extant medical literature. See Respondent's Brief in Opposition at 35, *Cavazos v. Smith*, 132 S. Ct. 2 (2011) (No. 10-1115) (citing Faris A. Bandak, *Shaken Baby Syndrome: A Biomechanics Analysis of Injury Mechanisms*, 151 *Forensic Sci. Int'l* 71, 71-79 (2005)).
- 17 Joëlle Anne Moreno & Brian Holmgren, *The Supreme Court Screws Up the Science: There Is No Abusive Head Trauma/Shaken Baby Syndrome Controversy*, 2013 *Utah L. Rev.* (forthcoming).
- 18 According to Dr. Daniel Lindberg of Brigham and Women's Hospital, the AHT/SBS controversy has been manufactured based "exclusively on the opinions and work of 'experts' who derive substantial income from lucrative court testimony on behalf of the accused perpetrators of child abuse" and "rarely, if ever, provide medical care for children." Carey Goldberg, *The Real Consensus on Shaken Baby Syndrome?*, *WBUR's CommonHealth Reform & Reality* (Sept. 27, 2010, 5:12 PM), [http:// commonhealth.wbur.org/2010/09/shaken-baby/](http://commonhealth.wbur.org/2010/09/shaken-baby/); see also Narang, *supra* note 8, at 593-94 ("[T]he pecuniary interest in providing expert testimony cannot be underestimated. It has posed and continues to pose a significant risk to the presentation of unbiased medical information.... [I]n addition to pecuniary interest, as discussed above, personal prejudices can also affect scientific analysis. This can result in the adherence to disproven theories and the presentation of skewed information."); Kenneth Feldman, *Commentary on Congenital Rickets Article*, 39 *Pediatric Radiology* 1127, 1128-29 (2009) (providing example of pecuniary interests of repeat expert witnesses).
- 19 Ceccarelli, *supra* note 1, at 197.

- 20 Narang, *supra* note 8, at 541 (noting that all of the medical papers “‘questioning’ the validity of AHT (save two or three) are non-randomized, retrospective case series/reports, and without comparative control groups. In fact, many are single case reports.”).
- 21 See Moreno & Holmgren, *supra* note 17; Sandeep Narang et al., A Daubert Analysis of Abusive Head Trauma/Shaken Baby Syndrome, Part II: An Examination of the Differential Diagnosis, 13 Hous. J. Health L. & Pol’y (forthcoming 2013).
- 22 Calif. Gov. Commutes Shirley Ree Smith’s Sentence in Shaken Baby Case, CBSNews (April 6, 2012, 4:52 PM), http://www.cbsnews.com/8301-504083_162-57410659-504083/calif-gov-commutes-shirley-ree-smiths-sentence-in-shaken-baby-case. It is unclear what influence the multiple opinions of the Ninth Circuit and Justice Ginsburg’s dissenting opinion may have had on Governor Brown’s decision. The remaining sections of this Article should clarify whether the medical and nonmedical evidence relied on (or ignored) by the Ninth Circuit and the Smith Court’s three dissenting justices actually raises “significant doubts” about the guilt of the defendant.
- 23 Symposium, Examining Shaken Baby Syndrome Convictions in Light of New Medical Scientific Research, 37 Okla. City U. L. Rev. 219 (2012); Keith A. Findley et al., Shaken Baby Syndrome, Abusive Head Trauma, and Actual Innocence: Getting It Right, 12 Hous. J. Health L. & Pol’y 209 (2012); Edward J. Imwinkelried, Shaken Baby Syndrome: A Genuine Battle of the Scientific (and Non-Scientific) Experts, 46 Crim. L. Bull. 156 (2010); Deborah Tuerkheimer, The Next Innocence Project: Shaken Baby Syndrome and the Criminal Courts, 87 Wash. U. L. Rev. 1 (2009) [hereinafter Tuerkheimer, The Next Innocence Project]; Deborah Tuerkheimer, Science-Dependent Prosecution and the Problem of Epistemic Contingency: A Study of Shaken Baby Syndrome, 62 Ala. L. Rev. 513 (2011) [hereinafter Tuerkheimer, Science-Dependent Prosecution].
- 24 Rachel Burg, Note, Un-Convicting the Innocent: The Case for Shaken Baby Syndrome Review Panels, 45 U. Mich. J.L. Reform 657 (2012); Molly Gena, Comment, Shaken Baby Syndrome: Medical Uncertainty Casts Doubts on Convictions, 2007 Wis. L. Rev. 701; Genie Lyons, Comment & Note, Shaken Baby Syndrome: A Questionable Scientific Syndrome and a Dangerous Legal Concept, 2003 Utah L. Rev. 1109, 1132 (asserting that “[f]or many years now, attorneys have been willing to prosecute, and juries have been willing to convict, people whose only clearly established mistake was caring for a baby that died”); Daniel G. Orenstein, Comment, Shaken to the Core: Emerging Scientific Opinion and Post-Conviction Relief in Cases of Shaken Baby Syndrome, 42 Ariz. St. L.J. 1305 (2011); Lauren Quint, Note, Bridging the Gap: An Application of Social Frameworks Evidence to Shaken Baby Syndrome, 62 Hastings L.J. 1839 (2011). A few defense practitioners have authored similar articles, which suffer from the same shortcomings of selective, improper, or incomplete citation. See, e.g., Matthew D. Ramsey, A Nuts and Bolts Approach to Litigating the Shaken Baby or Shaken Impact Syndrome, 188 Mil. L. Rev. 1 (2006); Elizabeth A. Walker, Shaken Baby Syndrome: Daubert and MRE 702’s Failure to Exclude Unreliable Scientific Evidence and the Need for Reform, 210 Mil. L. Rev. 1 (2011).
- 25 See *infra* Part II.C.
- 26 Lyons, *supra* note 24, at 1109.
- 27 Imwinkelried, *supra* note 23, at 158 (“The question here is whether shaken baby syndrome evidence is ‘junk’ science presenting an intolerable risk of a wrongful conviction....”).
- 28 Orenstein, *supra* note 24, at 1306.
- 29 Tuerkheimer, The Next Innocence Project, *supra* note 23, at 11.
- 30 See Narang, *supra* note 8, at 574-76 (listing organizations endorsing the validity of AHT/SBS promulgated by the World Health Organization, the American Academy of Pediatrics, the American Academy of Ophthalmology, the American Association for Pediatric Ophthalmology and Strabismus, the American College of Radiology, the American Academy of Family Physicians, the American College of Surgeons, the American Association of Neurologic Surgeons, the Pediatric Orthopedic Society of North America, the American College of Emergency Physicians, the American Academy of Neurology, the Royal College of Pediatrics and Child Health, the Royal College of Radiologists, the Royal College of Ophthalmologists, and the Canadian Pediatric Society).
- 31 Haack, *supra* note 1, at 998.
- 32 Patrick Yeagle, Caretaker or Killer? New Research on Shaken Baby Syndrome Could Set Pamela Jacobazzi Free. Ill. Times (May 5, 2011), <http://www.illinoistimes.com/Springfield/article-8622-caregiver-or-killer.html> (quoting frequent defense medical witness

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- Dr. John Plunkett); see *infra* notes 110-121 and accompanying text (identifying the bias of various defense witnesses and their own public pronouncements on the subject of AHT/SBS).
- 33 Daniel M. Albert et al., Ensuring Appropriate Expert Testimony for Cases Involving the "Shaken Baby," 308 JAMA 39, 40 (2012).
- 34 *Id.*
- 35 Fed. R. Evid. 702 advisory committee's note (quoting *Daubert v. Merrill Dow Pharm., Inc.*, 43 F.3d 1311, 1317 (9th Cir 1995)).
- 36 Albert et al., *supra* note 33, at 39. Neuropathologists, radiologists, hematologists, and biomechanicians have also contributed to the literature in support of AHT/SBS. See sources cited *supra* notes 8-9.
- 37 Albert et al., *supra* note 33, at 39; see also Sabine A. Maguire et al., Which Clinical Features Distinguish Inflicted from Non-Inflicted Brain Injury? A Systematic Review, 94 Archives Disease in Childhood 860, 865-66 (2009) (noting the positive predictive value of retinal hemorrhages and apnea in AHT, but explaining that, as in most cases of physical child abuse, there is no diagnostic test for inflicted brain injury and the diagnosis is made on the basis of probability after careful exclusion of other possible causes for the clinical findings, including accidental injury and other medical conditions). Contrary to the representations made by most defense witnesses and legal scholars challenging the diagnosis of AHT/SBS, the diagnosis of this form of trauma is not made exclusively on the basis of the triad of injuries, but instead as part of an extensive differential diagnostic process that considers all aspects of the medical evaluation along with all of the investigative information from other relevant nonmedical sources. See *infra* notes 61-64 and accompanying text.
- 38 See Tuerkheimer, The Next Innocence Project, *supra* note 23, at 2 (claiming that her article "identifies a criminal justice crisis"); Burg, *supra* note 24, at 660 (suggesting that the medical community has shifted towards skepticism of SBS, but that innocent people continue to be falsely convicted on the basis of this scientifically questionable diagnosis); Lyons, *supra* note 24, at 1132 ("For many years now, attorneys have been willing to prosecute, and juries have been willing to convict, people whose only clearly established mistake was caring for a baby that died."); Orenstein, *supra* note 24, at 1305-07 (alleging that "the American criminal justice system ... [must] address concerns that SBS theory has potentially sent wrongfully convicted persons to prison").
- 39 The vast majority of the exonerations secured by the Innocence Project have been based on the legitimate science of DNA sampling and testing. Thus, the comparison between the valid and widely accepted science of DNA analysis and outlier litigation-driven challenges to the validity of AHT/SBS is especially inapt. Peter J. Neufeld, an Innocence Project cofounder, has specifically bemoaned courts' reliance on specious litigation-driven science and advocated for more stringent screening including more careful application of the criteria outlined in *Daubert v. Merrell Dow Pharmaceuticals Inc.*, 509 U.S. 579 (1993). See Peter J. Neufeld, The (Near) Irrelevance of *Daubert* to Criminal Justice and Some Suggestions for Reform, 95 Am. J. Pub. Health S107 (2005).
- 40 As Chief Justice John Roberts lamented in his June 2011 address to the Fourth Circuit Judicial Conference, "Pick up a copy of any law review that you see and the first article is likely to be, you know, the influence of Immanuel Kant on evidentiary approaches in 18th century Bulgaria." Richard Brust, The High Bench vs. The Ivory Tower, A.B.A. J. (Feb. 17, 2012, 7:12 CDT), http://www.abajournal.com/mobile/article/the_high_bench_vs_the_ivory.
- 41 See *infra* notes 47, 69-71, 74, 81-91 and accompanying text (noting judicial decisions on SBS).
- 42 See Christian & Block, *supra* note 15, at 1409-11 (setting forth the American Academy of Pediatrics position paper on AHT and discussing the public health and prevention efforts encouraged by the Academy to educate parents about the dangers of shaking); Mark S. Dias et al., Preventing Abusive Head Trauma Among Infants and Young Children: A Hospital-Based, Parent Education Program, 115 Pediatrics e470, e470-e477 (2005) (documenting success in the reduction of AHT through hospital-based education programs regarding SBS in several regions of New York over a five-year time period).
- 43 Rachel P. Berger et al., Abusive Head Trauma During a Time of Increased Unemployment: A Multicenter Analysis, 128 Pediatrics 637, 637-42 (2011) (noting that similar findings in other parts of the country would correlate to hundreds or thousands of additional AHT cases); see Liz Szabo, Recession Linked to Increase in Shaken Baby Syndrome, USA Today (May 3, 2010, 1:06 PM), http://www.usatoday.com/news/health/2010-05-03-abuse03_ST_N.htm; Incidence of Child Abuse Skyrocketed During Recent Recession, Children's Hospital of Pittsburgh of UPMC-led Study Finds, Children's Hosp. Pittsburgh (May 10, 2010), <http://www.chp.edu/CHP/050110>.

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 44 See Albert et al., *supra* note 33, at 39.
- 45 See *supra* note 42 (detailing recent prevention efforts).
- 46 See *infra* Part III.E.
- 47 See, e.g., *Flick v. Warren*, 465 F. App'x 461, 464-65 (6th Cir. 2012) (denial of habeas alleging ineffective assistance of counsel for failure to challenge prosecution testimony involving SBS and failure to obtain defense expert); *Grant v. Warden*, No. TSRCV030004233S, 2008 Conn. Super. LEXIS 1402, at *1 (Conn. Super. Ct. June 4, 2008) (same); *Day v. State*, 303 P.3d 291, 296 (Okla. Crim. App. 2013) (upholding admissibility of expert testimony regarding SBS while acknowledging that the record reflected a disagreement among experts about the underlying science); *In re Brooks*, 138 Wash. App. 1005, 2007 WL 1129655 at *1 (2007) (unpublished table decision) (denial of restraint petition alleging newly discovered evidence involving medical research allegedly supporting alternative theories for head injuries); *State v. Louis*, 798 N.W.2d 319 (Wis. Ct. App. 2011) (unpublished table decision) (granting new trial based on inaccurate defense representations of shifts in science and newly discovered evidence); *State v. Edmunds*, 746 N.W.2d 590, 598-99 (Wis. Ct. App. 2008) (granting relief on claims of newly discovered evidence, rather than insufficient evidence).
- 48 For a recent concrete example of an outlier theory published along with critical responses, see Kathy A. Keller & Patrick D. Barnes, *Rickets vs. Abuse: A National and International Epidemic*, 38 *Pediatric Radiology* 1210 (2008) (proposing that "congenital rickets" could account for multiple fractures in several alleged child abuse cases). That article was published not as an accepted peer-reviewed article but instead as a "comment" along with invited critiques from numerous other doctors and the editors of the journal in which it was published. *Id.*; see, e.g., Thomas L. Slovis & Stephen Chapman, *Vitamin D Insufficiency/Deficiency--A Conundrum*, 38 *Pediatric Radiology* 1153 (2008); Thomas L. Slovis & Stephen Chapman, *Evaluating the Data Concerning Vitamin D Insufficiency/Deficiency and Child Abuse*, 38 *Pediatric Radiology* 1221 (2008) (providing the editor's comments about the lack of scientific support for the conclusions made by Drs. Keller and Barnes); Carole Jenny, *Rickets or Abuse?*, 38 *Pediatric Radiology* 1219 (2008) (criticizing the methodology used by Drs. Barnes and Keller and their selection bias based on their extensive experience as expert witnesses); Feldman, *supra* note 18, at 1127 (noting that several cases presented by Drs. Barnes and Keller contained significant omissions, including findings not seen by several other radiologists who reviewed the films and the authors' failure to disclose their role as defense experts who routinely testify in cases where this defense is advanced).
- Although the focus of this Article is the diagnosis of AHT/SBS, similar problems arise in child abuse and child homicide cases involving different types of injuries. See, e.g., Joëlle Anne Moreno, *Einstein on the Bench?: Exposing What Judges Do Not Know About Science and Using Child Abuse Cases to Improve How Courts Evaluate Scientific Evidence*, 64 *Ohio St. L.J.* 531, 535-36 (2003) (exploring the unscientific diagnosis of "temporary brittle bone disease" offered by defense witnesses to explain fracture injuries in children). In a recent child abuse trial in San Diego involving multiple fractures to a baby, Dr. Patrick Barnes testified for the defendant and attributed the child's injuries to congenital rickets. See Reporter's Transcript of Proceedings at 12-13, *People v. Sanders*, No. SCD 226563 (Cal. Super. Ct. Aug. 2, 2011) (testimony of Dr. Patrick Barnes) (on file with authors). Dr. Barnes supported his testimony with an article he wrote with his wife. *Id.* at 75 (referencing Keller & Barnes, *supra*, at 1210-16). Dr. Barnes represented to the court that his article had been published in a peer-reviewed journal, which was true. Dr. Barnes failed to inform the court, however, that the article had not been peer-reviewed because it was published as a "commentary." Dr. Barnes also failed to acknowledge that the article had been subjected to extensive written critique from numerous other doctors and from the editors of the journal in which it was published. See *id.* at 12-13.
- 49 See, e.g., Catherine Adamsbaum et al., *Abusive Head Trauma: Judicial Admissions Highlight Violent and Repetitive Shaking*, 126 *Pediatrics* 546, 550, 554 (2010); Suzanne P. Starling et al., *Abusive Head Trauma: The Relationship of Perpetrators to Their Victims*, 95 *Pediatrics* 259, 261 (1995) [hereinafter Starling et al., *Abusive Head Trauma*]; Suzanne P. Starling et al., *Analysis of Perpetrator Admissions to Inflicted Traumatic Brain Injury in Children*, 158 *Archives Pediatrics & Adolescent Med.* 454, 456-57 (2004) [hereinafter Starling et al., *Analysis of Perpetrator Admissions*].
- 50 See, e.g., Keith Findley, Clinical Professor, Presentation at Twelfth International Conference on Shaken Baby Syndrome / Abusive Head Trauma: What Role Should Confessions Play in Diagnosing Abusive Head Trauma? (Oct. 1, 2012); see also Symposium, *supra* note 23, at 232 (statement of Professor Keith Findley) (proposing that confessions and adjudications are not reliable for supporting the "hypothesis" of SBS).
- 51 See, e.g., Jan E. Leestma, "Shaken Baby Syndrome": Do Confessions by Alleged Perpetrators Validate the Concept?, 11 *J. Am. Physicians & Surgeons* 14, 14-15.

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 52 See *infra* note 71 and accompanying text.
- 53 See *infra* Part II.B (discussing *State v. Edmunds*, 746 N.W.2d 590 (Wis. Ct. App. 2008)).
- 54 David Sackett et al., *Evidence Based Medicine: What It Is and What It Isn't*, 312 *BMJ* 71 (1996).
- 55 Goldberg, *supra* note 18 (including a comment from Lucy B. Rorke-Adams, M.D., Senior Neuropathologist, The Children's Hospital of Philadelphia, Consultant Neuropathologist, Office of the Medical Examiner of Philadelphia). Dr. Rorke-Adams continued, There has been a growing body of well-done scientific work confirming the various aspects of this syndrome, specifically, the pathogenesis of subdural hematomas, the nature of the retinal hemorrhages and more serious retinal injury, the pathophysiology of the concussion which results from shaking, the reality of the severe spinal cord injury[,] etc. It is well-recognized that there may be mimics of SBS and physicians dealing with the clinical and pathological diagnosis of babies presenting with signs of abuse meticulously explore all other possibilities before concluding that the illness or death is not a consequence of natural causes. The small number of "experts" who challenge this enormous body of evidence are, for the most part, not involved in the day-to-day practice of pediatrics, neurosurgery or pediatric forensic pathology/neuropathology. Rorke-Adams, Comment to Goldberg, *supra* note 18.
- 56 See Mark Donohoe, *Evidence-Based Medicine and Shaken Baby Syndrome*, 24 *Am. J. Forensic Med. & Pathology* 239 (2003); *infra* text accompanying note 114.
- 57 See Moreno & Holmgren, *supra* note 17.
- 58 See *supra* note 8 and accompanying text.
- 59 Albert et al., *supra* note 33 at 39.
- 60 *Id.*
- 61 In the opinion of the Medill Innocence Project and Professor Alec Klein, "If the classic triad of shaken-baby syndrome symptoms is present-- retinal bleeding, brain swelling and brain bleeding--it is often assumed that a caregiver caused them. But science has evolved and some of the assumptions are being challenged." *Rethinking Shaken Baby Syndrome Convictions: Medill Innocence Project Begins Investigating Potential Miscarriages of Justice*, Nw. Univ. (Oct. 2, 2012), <http://www.northwestern.edu/newscenter/stories/2012/10/rethinking-shaken-baby-syndrome-convictions.html>; see also Symposium, *supra* note 23, at 222-23 (statement of Professor Keith Findley) (asserting that the traditional theory is that the triad is caused exclusively by shaking and is used to establish all the elements of the crime, and agreeing with Professor Tuerkheimer's assertion that the traditional theory amounts to "medically diagnosed murder"); Tuerkheimer, *The Next Innocence Project*, *supra* note 23, at 6-18 (claiming the medical diagnosis of SBS and criminal convictions are based almost exclusively on the triad); Tuerkheimer, *Science-Dependent Prosecution*, *supra* note 23 at 515 (claiming "the classic formulation of SBS is based exclusively on the diagnostic 'triad'").
- 62 See Maguire et al., *supra* note 37 (noting the positive predictive value of retinal hemorrhages and apnea in AHT, but explaining that, as in all cases of physical child abuse, there is no diagnostic test for inflicted brain injury and the diagnosis is made on the basis of probability after careful exclusion of other possible causes for the clinical findings including accidental injury and other medical conditions). For an excellent discussion of the differential diagnostic process engaged in by medical professionals, and the consideration of alternative causes, see Stephen C. Boos, *Abusive Head Trauma as a Medical Diagnosis*, in *Abusive Head Trauma in Infants and Children: A Medical, Legal, and Forensic Reference*, *supra* note 9, at 49; Andrew P. Sirontak, *Medical Disorders that Mimic Abusive Head Trauma*, in *Abusive Head Trauma in Infants and Children: A Medical, Legal, and Forensic Reference*, *supra*, at 191. This differential diagnostic process is not new and has been well described for over two decades. See generally Carolyn J. Levitt, Wilbur L. Smith & Randell C. Alexander, *Abusive Head Trauma*, in *Child Abuse, Medical Diagnosis and Management* 1-23 (Robert M. Reece ed., 1994) (describing the differential diagnostic process).
- 63 See Symposium, *supra* note 23, at 224-25 (statement of Professor Keith Findley); Tuerkheimer, *The Next Innocence Project*, *supra* note 23, at 5 (explaining that "[w]ith rare exception, the case turns on the testimony of medical experts" and "SBS comes as close as one could imagine to a medical diagnosis of murder: prosecutors use it to prove the mechanism of death, the intent to harm, and the identity of the killer" because "all elements of the crime--mens rea and actus reus (which includes both the act itself and causation of the resulting harm)--are proven by the science"). These are strong allegations, which make it surprising that the only support provided by Professor Tuerkheimer is a citation to two cases, neither of which represents a triad-only prosecution. See Tuerkheimer, *The Next*

Innocence Project, *supra* note 23, at 7 (citing *Mitchell v. State*, No. CACR 07-472, 2008 WL 316166, at *1 (Ark. Ct. App. Feb. 6, 2008), and *State v. Edmunds*, 598 N.W.2d 290, 293 (Wis. Ct. App. 1999)). Professor Findley also mischaracterizes Edmunds as a triad-based prosecution, see Symposium, *supra* note 23, at 224 (statement of Professor Keith Findley), despite the fact that having handled her postconviction petition he is well aware of the extensive additional evidence of Edmunds's guilt, including evidence that she was previously witnessed assaulting another child in her care, Edmunds's own inculpatory trial testimony, and the medical evidence of impact injury. See *Edmunds v. Deppisch*, 313 F.3d 997 (7th Cir. 2002), cert. denied, 538 U.S. 1066 (2003) (commenting on the findings made by the trial judge on this issue). See also *infra* notes 103-107 and accompanying text noting Professor Tuerkheimer's erroneous assertions in this regard. Brian Holmgren, a coauthor on this Article, has twenty-five years of experience prosecuting child abuse cases. He has never prosecuted a triad-only case and has yet to find one reported in the appellate reports.

64 Symposium, *supra* note 23, at 232-33 (statement of Professor Keith Findley) (arguing that doctors make two types of prosecution mistakes: (1) "selection bias" mistakes when they consider confession evidence as relevant to an abuse diagnosis, and (2) "observer bias" mistakes because doctors, in their view, prefer to diagnose abuse and "you're more likely to see something when you want to see it"); Tuerkheimer, *The Next Innocence Project*, *supra* note 23 at 6 (claiming the medical diagnosis of SBS has been "corrupted by a too-close medical-legal nexus").

65 7 Mass. L. Rptr. 449, No. 970433, 1997 WL 694119 (Super. Ct. Nov. 10, 1997), *aff'd*, 694 N.E.2d 1277 (Mass. 1998).

66 Carey Goldberg, *Massachusetts High Court Backs Freeing Au Pair in Baby's Death*, N.Y. Times, June 17, 1998, at A1. At trial, the prosecutor in the Woodward case challenged Judge Hiller Zoebel's reduction of Woodward's second degree murder conviction to manslaughter, the lighter associated sentence allowed her to return to England. The prosecution alleged judicial bias, in part based on the fact that prior to the trial, Judge Zoebel inappropriately proposed that the prosecutor offer a plea to manslaughter. See *Commonwealth v. Woodward*, 694 N.E.2d 1277, 1277 (Mass. 1998). But the sentence reduction does not imply that Woodward did not cause the injuries or death of Matthew Eapen, or that the prosecution's medical proof was questionable. *Id.* (setting forth Judge Zoebel's reasons for denying Woodward's motion for acquittal and a new trial).

67 See Bill Carter, *Media Talk; Irate Boston Media Fault '60 Minutes' For Nanny Report*, N.Y. Times, Mar. 15, 1999, at C9. In March 1998, following Louise Woodward's conviction, Mike Wallace of 60 Minutes broadcast an interview with Dr. Floyd Gillis, which included the doctor's opinion that Matthew Eapen did not die of AHT/SBS, but instead was strangled to death, an opinion offered by none of the witnesses at trial. *Id.* Mr. Wallace failed to disclose, however, that Dr. Gillis's opinion was based on the opinion of Dr. Marvin Nelson—a paid consultant for the defense in the Woodward case. *Id.* Thus, Mike Wallace's misleading report directly contributed to the growing national confusion regarding the validity of the medical evidence offered to support the AHT/SBS diagnosis that had been presented at trial. *Id.* For published discussion of those medical findings, see Patrick D. Barnes & Caroline D. Robson, *CT Findings in Hyperacute Nonaccidental Brain Injury*, 30 *Pediatric Radiology* 74, 75-80 (2000) [hereinafter Barnes & Robson, *CT Findings*]; Patrick D. Barnes & Caroline D. Robson, *An Unresponsive Infant in the Emergency Room*, 6 *Seminars in Pediatric Neurology* 225, 225-27 (1999). Dr. Barnes was a prosecution expert at Woodward's trial and these papers discuss the medical findings from the case. For an expression of the medical consensus on these injuries and a response to the proffered claims of the defense witnesses at the Woodward trial, see David L. Chadwick et al., *Shaken Baby Syndrome--A Forensic Pediatric Response*, 101 *Pediatrics* 321, 321-23 (1998) (critiquing the accuracy of medical testimony provided by defense witnesses during the Woodward trial and signed by over seventy physicians).

68 Two of these doctors are Dr. Jan Leestma and Dr. Ronald Uscinski, who have been frequent defense witnesses since Woodward and whose papers are cited by the Smith dissenters. See Moreno & Holmgren, *supra* note 17 (discussing the controversial positions and testimony of Drs. Leestma and Uscinski).

69 See, e.g., *Commonwealth v. Martin*, 290 S.W.3d 59, 69 (Ky. Ct. App. 2008) (reversing the trial court's exclusion of testimony on SBS following a Daubert hearing at which Dr. Ronald Uscinski testified for the defense and challenged the scientific reliability of SBS); Transcript of Motion Hearing at 5-51, *State v. Mendoza*, No. 071908696 (Utah Dist. Ct. Nov. 10, 2008) (testimony of Dr. Janice Ophoven) (supporting a motion to exclude an SBS diagnosis on Daubert grounds).

70 *State v. Edmunds*, 746 N.W.2d 590, 592-93, 599 (Wis. Ct. App. 2008).

71 See, e.g., *Mitchell v. State*, No. CACR 07-472, 2008 WL 316166, at *3 (Ark. Ct. App. Feb. 6, 2008) (rejecting the defense claim that a Daubert hearing was required before testimony on SBS may be admitted); *Grant v. Warden*, No. TSRCV030004233S, 2008 Conn. Super. LEXIS 1402, at *35-36 (Conn. Super. Ct. June 4, 2008) (noting that the Connecticut Supreme Court found that SBS satisfied the Frye standard in 1988); *People v. Armstrong*, 919 N.E.2d 1111, 1112 (Ill. App. Ct. 2009) (agreeing with the trial court findings that SBS

is generally accepted in the medical field based on prior decisions and that evidence of SBS is admissible at trial); *Middleton v. State*, 980 So. 2d 351, 356 (Miss. Ct. App. 2008) (rejecting defendant's claim that the relevant medical community does not generally accept SBS and noting the acceptance of this diagnosis by other courts); *State v. Leibhart*, 662 N.W.2d 618, 627-28 (Neb. 2003) (finding that SBS is reliable under Daubert); *State v. Lopez*, 412 S.E.2d 390, 393 (S.C. 1991) (recognizing SBS as an extensively researched and accepted medical diagnosis in other jurisdictions). The Warden court referenced *State v. McClary*, 541 A.2d 96, 102 (Conn. 1988), which had also noted acceptance by six other states. Warden, 2008 Conn. Super. LEXIS 1402, at *36; see *Lutze v. Sherry*, No. 07-11227, 2008 WL 2397640, at *11, *14 (E.D. Mich. June 11, 2008) (agreeing with the state trial court that "SBS has been a valid recognized medical diagnosis based on scientific evidence"); *People v. Renteria*, No. F045737, 2005 Cal. App. Unpub. LEXIS 8834, at *20-21 (Cal. Ct. App. Sept. 28, 2005) (allowing testimony of medical experts on SBS, despite being an "inexact science"); *State v. Woodson*, No. 85727, 2005 WL 2789082, at *6 (Ohio Ct. App. Oct. 27, 2005) (recognizing that case law establishes that SBS is within the medically accepted literature and has been admitted in courtrooms in the state and nationwide); *State v. Vandemark*, No. CR.A. 04-01-0225, 2004 WL 2746157, at *3 (Del. Super. Ct. Nov. 19, 2004) (recognizing that the science behind SBS has been accepted in almost every jurisdiction and is generally accepted in pediatrics); *People v. Cauley*, 32 P.3d 602, 606-08 (Colo. App. 2001) (upholding trial court's admission of SBS evidence).

72 See Goldberg, *supra* note 18.

73 Charles Gill, Comment to Goldberg, *supra* note 18.

74 See *infra* Part II.B (discussing *Edmunds*, 746 N.W.2d at 590); see also *People v. Rector*, 226 P.3d 1170, 1173-75 (Colo. Ct. App. 2009), *rev'd*, 248 P.3d 1196 (Colo. 2011) (reversing because trial judge failed to conduct hearing to determine whether doctor's testimony on nonaccidental head trauma was based on reliable scientific principles, failing to appropriately consider holding in *People v. Martinez*, 74 P.3d 316 (Colo. 2003) approving similar testimony); *Hamilton v. Commonwealth*, 293 S.W.3d 413, 420 (Ky. Ct. App. 2009) (holding that it was error to permit testimony on SBS without first conducting a Daubert hearing because no Kentucky case had specifically determined it was a reliable theory); *State v. Schoonmaker*, 176 P.3d 1105, 1114-16 (N.M. 2008) (reversing conviction based on ineffective assistance of counsel claim for defense attorney's failure to get an expert to support defense that a five-week-old baby fell off couch and citing defense expert testimony in other cases and inapplicable defense literature as support for holding); *State v. Louis*, 798 N.W.2d 319 (Wis. Ct. App. 2011) (unpublished table decision) (upholding trial court's order for new trial based on erroneous determinations by the trial and appellate court "that medical community is sharply divided" on diagnostic findings for AHT).

75 746 N.W.2d 590 (Wis. Ct. App. 2008).

76 See *id.* at 592. In fact, Judge Dykman, writing for the court, actually thanks the Wisconsin law school students by name in the text of the decision. *Id.* at 592 n.1.

77 See *id.*

78 *State v. Edmunds*, 598 N.W. 2d 290, 299 (Wis. Ct. App. 1999)

79 See *Edmunds v. Deppisch*, 313 F.3d 997, 997-98 (7th Cir. 2002).

80 *Edmunds*, 746 N.W.2d at 593.

81 See *id.* *Edmunds* presented affidavits and testimony from the following defense medical witnesses (none of whom regularly treat infants with traumatic injuries): Dr. Patrick Barnes (a pediatric neuroradiologist), Dr. Horace Gardner (a retired military ophthalmologist), Dr. John Galaznik (a university health services physician), Dr. Peter Stephens (a forensic pathologist), and Dr. George Nichols (a forensic pathologist). *Edmunds* also presented evidence from the original medical examiner, Dr. Robert Huntington, who apparently had modified his position on the potential timing of Natalie's fatal head injuries but maintained that her cause of death was AHT. See *id.*

82 *Id.* The state court summarized the defense testimony as arguing that "there is now a significant debate in the medical community as to whether Natalie's symptoms were necessarily indicative of shaking or shaking combined with head trauma in infants. The experts explained that there was not a significant debate about this issue in the mid-1990s and that the opinions offered in *Edmunds's* first postconviction motion would have been considered minority or fringe medical opinions." *Id.*

83 See *State v. Edmunds*, No. 96-CF-555, slip op. at 7 (Wis. Cir. Ct. Mar. 29, 2007).

84 See *id.*

85 *Edmunds*, 746 N.W.2d at 598-99.

86 *Id.* at 597.

87 *Id.*

88 *Id.*

89 *Id.* at 599. Of course, this ruling was made under the court's unique interpretation of Wisconsin's procedural rules for postconviction petitions alleging "newly discovered evidence." Thus, this ruling has little or no precedential value for other jurisdictions that use different rules. Moreover, the Wisconsin rules create an odd outcome by mandating that any time a trial court determines that a defendant's postconviction "expert" is credible, or even that the evidence presented by the state is stronger, a new trial is required. The problems created by these state rules should be readily apparent to anyone familiar with postconviction litigation--especially in AHT/SBS cases. They were certainly obvious to the judge in *Grant v. Warden*, No. TSRCV030004233S, 2008 Conn. Super. LEXIS 1402 (Conn. Super. Ct. June 4, 2008), who immediately after *Edmunds* opined that "[t]he *Edmunds* case presents a potential quagmire of epic proportions: the strong likelihood of constant renewed prosecution and relitigation of criminal charges as expert opinion changes and/or evolves over time" and that "the strong interest in the finality of judgments is significantly undermined by reasoning employed by the *Edmunds* court." *Id.* at *2 n.1.

90 *Edmunds*, 746 N.W.2d at 598-99.

91 For example, several of the purportedly credible defense witnesses testified that shaking alone could not have caused Natalie's injuries and that biomechanics research did not support the SBS diagnosis. See, e.g., Transcript of Evidentiary Hearing (Day 1) at 29-30, 37, *State v. Edmunds*, No. 96-CF-555 (Wis. Cir. Ct. 1997) (testimony of Dr. Patrick Barnes); Transcript of Evidentiary Hearing (Day 2) at 133-35, 147-48, *State v. Edmunds*, No. 96-CF-555 (Wis. Cir. Ct. 1997) (testimony of Dr. George Nichols). This evidence should not have confirmed the witnesses' credibility, but should instead have raised concerns for three reasons. First, Natalie had evidence of blunt impact trauma to her head, making her case not a "shaking alone" case, but a "shaking plus impact" case, which (as the defense witnesses surely must have known but opted not to share with the court) made these biomechanics arguments irrelevant. Second, because the biomechanics literature predated *Edmunds*'s trial, it was not "newly discovered evidence." See generally Ann-Christine Duhaime et al., *The Shaken Baby Syndrome: A Clinical, Pathological and Biomechanical Study*, 66 *J. Neurosurgery* 409 (1987) (reviewing forty-eight cases of infants and young children with SBS, including scans showing brain hemorrhaging, subdural or subarachnoid hemorrhaging, autopsies, and reporting on various biomechanical experiments of shaking and impact with a surrogate infant). Third, none of the well-documented critiques of the biomechanical research were acknowledged or addressed by the defense witnesses. See generally *Shaking and Other Nonaccidental Head Injuries in Children* (Robert A. Minns & J. Keith Brown eds., 2005) (summarizing multiple limitations regarding Dr. Duhaime's conclusions and listing contrary clinical and biomechanical evidence); C.Z. Cory & M.D. Jones, *Can Shaking Alone Cause Fatal Brain Injury?: A Biomechanical Assessment of the Duhaime Shaken Baby Syndrome Model*, 43 *Med. Sci. & L.* 317 (2003) (discussing the Duhaime model and concluding "[t] here must now be sufficient doubt in the reliability of the Duhaime et al. (1987) biomechanical study to warrant the exclusion of such testimony in cases of suspected shaken baby syndrome."); D.R. Wolfson et al., *Rigid-Body Modelling of Shaken Baby Syndrome*, 219 *J. Engineering Med.* 63 (2005) (discussing the use of rigid-body modeling to investigate neck stiffness on head motion and head-torso impacts as a possible mechanism of injury). In addition, defense witnesses opined that if Natalie were shaken violently, she should have sustained neck injuries, see Transcript of Evidentiary Hearing (Day 2), *supra*, at 153 (testimony of Dr. George Nichols), an outlier view supported by a single paper rife with methodological errors and the subject of extensive scathing criticism. See also *supra* note 17 (discussing critiques of Bandak, *supra* note 16). Finally, the defense witnesses' credibility should have been further undermined by the fact that they proposed numerous alternative theories to explain Natalie's injuries (i.e., a dysphagic choking episode, a "rebleed" of a prior subdural hematoma, irritation of her respiratory centers from a subarachnoid hemorrhage, hypoxia), see *id.*, despite the fact that these theories could not accurately account for Natalie's injuries, they were radically divergent and logically inconsistent, and none were substantiated by accepted medical literature.

92 See Deborah Tuerkheimer, Op-Ed., *Anatomy of a Misdiagnosis*, *N.Y. Times*, Sep. 21, 2010, at A31. Professor Findley recently appeared with Ms. Edmunds on a television program hosted by news journalist Katie Couric to proclaim Ms. Edmunds's innocence

and promote the false AHT/SBS controversy. Katie: Falsely Accused: Innocent Behind Bars (ABC television broadcast Dec. 10, 2012); see also Emily Bazelon, Shaken, N.Y. Times Mag., Feb. 6, 2011, at 30; Richard Ruelas, New Doubts in "Shaken Baby" Fatalities, Ariz. Republic, Sept. 16, 2012, at A1; Maia Szalavitz, The Shaky Science of Shaken Baby Syndrome, Time (Jan. 17, 2012), <http://healthland.time.com/2012/01/17/the-shaky-science-of-shaken-baby-syndrome>. Indeed, several articles have appeared more recently in response to the Smith dissent. See, e.g., Emily Bazelon, A Vindictive Decision: The Supreme Court Sends a Grandmother Back to Prison to Teach the 9th Circuit a Lesson, Slate (Nov. 28, 2011), http://www.slate.com/articles/news_and_politics/jurisprudence/2011/11/shaken_baby_syndrome_and_the_supreme_court_.html; A.C. Thompson & Joseph Shapiro, New Evidence Complicates High Profile Shaken Baby Case, Alaska Dispatch (Mar. 29, 2012), <http://www.alaskadispatch.com/article/new-evidence-complicates-high-profile-shaken-baby-case>; Carol J. Williams, A Pawn in a Legal Chess Match, L.A. Times (Dec. 16, 2010), <http://articles.latimes.com/2010/dec/16/local/la-me-1216-shaken-baby-verdict-20101216>.

93 See sources cited supra note 23.

94 See sources cited supra note 24.

95 See Tuerkheimer, Science-Dependent Prosecution, supra note 23, at 550 (describing the "national crisis in forensic science" as including "the SBS context [because] there is a tension between the criminal law's treatment of forensic science claims and what scientists now know about the validity of these [SBS] claims").t alpra note 98.ing at her new "piece of the parenthetical.icle. I could sign an article 'uted and there were guilty pleas in 8

96 Lyons, supra note 24, at 1109.

97 Imwinkelreid, supra note 23, at 158 ("The question here is whether shaken baby syndrome evidence is 'junk' science presenting an intolerable risk of a wrongful conviction....").t alpra note 98.ing at her new "piece of the parenthetical.icle. I could sign an article 'uted and there were guilty pleas in 8

98 Orenstein, supra note 24, at 1306.

99 Tuerkheimer, The Next Innocence Project, supra note 23, at 11.

100 Carey Goldberg, Pediatrics Academy President-Elect on "Shaken Baby Syndrome," WBUR's CommonHealth Reform & Reality (Oct. 4, 2010, 2:53 PM), <http://commonhealth.wbur.org/2010/10/pediatrics-academy-president-elect-on-shaken-baby-syndrome>.t alpra note 98.ing at her new "piece of the parenthetical.icle. I could sign an article 'uted and there were guilty pleas in 8

101 Id.

102 Desmond Runyan, Comment to Goldberg, supra note 18.

103 Id.

104 Id.

105 Id.

106 See Albert et al., supra note 33, at 40 ("The reported rates of child abuse resulting in homicide have been documented to be underreported by as much as 50% to 60%.").

107 Gill, supra note 73.

108 Dr. Robert W. Block explained that it is critical to recognize that "the real experts are the physicians who work every day with these cases and have both authored and read voluminous literature that substantiates the existence of abusive head trauma, and those are the folks who are the most capable of informing the public about what the issue really is" so as to distinguish them from the law professors or students or both who "creat[e] these sham media blasts that [cause] great confusion." See Goldberg, supra note 100.

109 See, e.g., Bandak, supra note 16; Donohoe, supra note 56; Jan E. Leestma, Case Analysis of Brain-Injured Admittedly Shaken Infants: 54 Cases, 1969-2001, 26 Am. J. Forensic Med. & Pathology 199 (2005); Rubin Miller & Marvin Miller, Overrepresentation of Males in Traumatic Brain Injury of Infancy and in Infants with Macrocephaly, 31 Am. J. Forensic Med. & Pathology 165 (2010); Waney

Squier, Shaken Baby Syndrome: The Quest for Evidence, 50 *Developmental Med. & Child Neurology* 10 (2008); Ronald Uscinski, Shaken Baby Syndrome: An Odyssey, 46 *Neurologia Medico-Chirurgica* 57 (2006).

110 Many articles that are written and then cited by defense experts fall far short of the type of peer-reviewed scientific literature standards contemplated by the Supreme Court in *Daubert v. Merrell Dow Pharmaceuticals*, 509 U.S. 579 (1993). As discussed above, frequent defense witness Dr. Patrick Barnes has, at least once, misleadingly suggested that an article was published in a peer-reviewed journal, while failing to explain that the article, because it was a commentary piece, had not been subject to peer review. See Keller & Barnes, *supra* note 48 and accompanying text. Dr. Barnes also published articles (single case reports) based on cases where he served as a defense witness. See Patrick D. Barnes et al., *Infant Acute Life-Threatening Event-- Dysphagic Choking Versus Nonaccidental Injury*, 17 *Seminars Pediatric Neurology* 7 (2010) [hereinafter Barnes et al., *Dysphagic Choking*]; Patrick D. Barnes et al., *Traumatic Spinal Cord Injury: Accidental Versus Nonaccidental Injury*, 15 *Seminars Pediatric Neurology* 178 (2008). Both articles were published in a topical journal that has publishing guidelines that do not include any form of peer-review process before publication. See *Neurology Advance*, [http:// www.neurologyadvance.com/content/neurologyadvance-journalpage-paedia](http://www.neurologyadvance.com/content/neurologyadvance-journalpage-paedia) (last visited June 13, 2013). Dr. Christopher S. Greeley has addressed the problems with Barnes's *Dysphagic Choking* at some length, noting that Dr. Barnes and his coauthors (1) omitted evidence of additional salient abuse injuries to the child; (2) omitted the fact that the case resulted in a child abuse trial, see *Thomas v. State*, No. 03-07-00646-CR, 2009 WL 1364348 (Tex. Ct. App. May 14, 2009); (3) omitted the fact that the defendant was convicted of child abuse; (4) omitted the fact that the defendant's conviction was affirmed on appeal; and (5) failed to reveal their own roles as defense witnesses at trial. See Dr. Christopher S. Greeley, Letter to the Editor, 17 *Seminars Pediatric Neurology* 275 (2010). There is also evidence that some authors, whose work has been published in nonpeer-reviewed journals or has been subjected to critical review, try to deter readers from discovering this type of discrediting evidence. For example, in a more recent paper, Dr. Barnes again postulated "dysphagic choking" as a mimic of AHT/SBS. Patrick D. Barnes, *Imaging of Nonaccidental Injury and the Mimics: Issues and Controversies in the Era of Evidence-Based Medicine*, 49 *Radiologic Clinics N. Am.* 205 (2011) [hereinafter Barnes, *Imaging of Nonaccidental Injury*]. However, rather than citing to his published paper on this topic (which would inevitably reveal Dr. Greeley's discrediting critique), he cited instead to a similarly titled conference presentation and failed to address (or even mention) Dr. Greeley's critique. *Id.* at 220 n.167.

111 A review of the medical sources cited in the recent spate of law review articles cited *supra* notes 23-24 reveals a common practice of citing to the same handful of defense witnesses for "scientific" support. Notably absent is any recognition of the abundant medical literature supporting the clinical and empirical validity of the AHT/SBS diagnosis. This form of selective citation is, as Professor Ceccarelli notes, a hallmark of manufactured scientific controversy. See Ceccarelli, *supra* note 1, at 196 and accompanying text. While Professor Tuerkheimer was writing her first article, *The Next Innocence Project: Shaken Baby Syndrome and the Criminal Courts*, *supra* note 23, she contacted one of this Article's authors, Brian Holmgren, for information and she was provided with over two-hundred pages of materials documenting the medical literature supporting the diagnosis of AHT/SBS and critiquing many of the sources she relied upon in her work. This material is conspicuously absent from all of Professor Tuerkheimer's academic work on AHT/SBS to date.

112 See Symposium, *supra* note 23 (transcribing remarks made during a joint presentation with frequent defense medical witness Patrick Barnes who Professor Findley had employed to testify on behalf of Audrey Edmunds); Findley et al., *supra* note 23.

113 Findley et al., *supra* note 23, at 299-300 ("[T]he real problem is that the literature cited in support of the SBS/AHT hypothesis falls at the bottom of the hierarchy of evidence and rests almost entirely on assumptions and hypotheses, combined with emotionally compelling demonstrations and anecdotal evidence, largely in the form of confessions."); Barnes, *Imaging of Nonaccidental Injury*, *supra* note 110 (characterizing "much of the traditional literature on child abuse ... [as] anecdotal case series, case reports, reviews, opinions, and position papers"); J.F. Geddes & J. Plunkett, *The Evidence Base for Shaken Baby Syndrome*, 328 *BMJ* 719, 719-20 (2004) (suggesting that the medical literature and diagnostic criteria supporting the AHT/SBS diagnosis are inadequate and flawed and expressing doubt about the existence of AHT/SBS); Jan E. Leestma, *Child Abuse: Neuropathology Perspectives*, in *Forensic Neuropathology* 561, 602 (Jan E. Leestma ed., 2d ed. 2008) (characterizing the medical literature linking shaking to pathology-injury findings as deficient and anecdotal).

114 See, e.g., Findley et al., *supra* note 23, at 237-38 (claiming that Dr. Mark Donohoe--the author of *Evidence-Based Medicine and Shaken Baby Syndrome*, *supra* note 56--"examined the research support for SBS through 1998 and concluded what others--including the NIH conference participants--had been saying privately for years: the research basis for shaken baby syndrome was remarkably weak" and citing Dr. Donohoe's conclusion that "the commonly held opinion that the finding of [subdural hemorrhage] and [retinal hemorrhage] in an infant was strong evidence [of] SBS was unsustainable, at least from the medical literature").

DISSENT INTO CONFUSION: THE SUPREME COURT,..., 2013 Utah L. Rev. 153

- Defense medical witnesses and legal academics routinely rely on Dr. Donohoe's single three-page article to support their assertions that AHT/SBS does not exist. For examples from the medical witness articles, see Barnes et al., *Dysphagic Choking*, supra note 110, at 1; Barnes, *Imaging of Nonaccidental Injury*, supra note 110, at 206; Geddes & Plunkett, supra note 113, at 719-20; Leestma, supra note 51, at 14; Leestma, supra note 109; Jan Leestma, *The So-Called "Shaken Baby Syndrome": A Concept Unsupported by Science and the Facts*, Ind. Defender, March 2006, at 1; James LeFanu, *Wrongful Diagnosis of Child Abuse--A Master Theory*, 98 J. Royal Soc'y Med. 249 (2005); Marvin Miller et al., *A Sojourn in the Abyss: Hypothesis, Theory, and Established Truth in Infant Head Injury*, 114 Pediatrics 326 (2004) (including as coauthors Patrick Barnes, Jan Leestma, John Plunkett, Ron Uscinski, and several others); Miller & Miller, supra note 109, at 169; Squier, supra note 109, at 11; Uscinski, supra note 109. For examples from the legal literature, see Burg, supra note 24, at 665 nn.53-56 and accompanying text; Gena, supra note 24, at 706 n.56, 710 n.95-100, 711 n.101, 727 n.270 and accompanying text; Ramsey, supra note 24, at 26 n.143; Tuerkheimer, *The Next Innocence Project*, supra note 23, at 12 n.70-74, 13 n.75-79 and accompanying text; Walker, supra note 24, at 28 n.188-90, 37 n.239-43, 38 n.244-45, 39 n.252-57 and accompanying text.
- 115 For examples from the medical witness articles, see Leestma, supra note 113, at 577, 600-04 (questioning the findings of several articles related to shaking without impact causing SBS); Waney Squier, *The "Shaken Baby" Syndrome: Pathology and Mechanisms*, 122 Acta Neuropathologica 519, 520 (2011) (same); Uscinski, supra note 109 (calling SBS a hypothetical supposition). For examples from the legal literature see Symposium, supra note 23, at 226 (statement of Professor Keith Findley) ("We ... learned a lot from biomechanical engineers who had been studying the thresholds for brain injuries of the type we see here. What they found was that human adults simply cannot shake an infant hard enough to inflict the kinds of head injuries that we see in these cases"); Findley et al., supra note 23, at 215 ("[B]iomechanical studies have consistently concluded that shaking does not generate enough force to produce the types of traumatic damage associated with SBS/AHT").
- 116 For examples from the medical witness articles see Barnes, *Imaging of Nonaccidental Injury*, supra note 110, at 212 (suggesting that shaking would cause injuries to the neck and upper spinal cord); Leestma, supra note 113, at 577 (same); Uscinski, supra note 109, at 59 (same). For examples from the legal articles, see Burg, supra note 24, at 666 ("[T]he brain injuries associated with the triad cannot occur by shaking without the child also suffering injury to the neck, cervical spinal column, or cervical spinal cord."); Findley, et al., supra note 23, at 237 ("[S]haking does not produce the force required to rupture bridging veins and axons and would cause extensive cervical spine injury or failure (i.e., neck injury) before causing such effects."); Gena, supra note 24, at 711-12; Orenstein, supra note 24, at 1312 ("[S]haking alone produces insufficient force to cause the observed injuries [and] shaking that does produce such force would cause spinal or neck injuries that are typically absent in SBS cases."); Tuerkheimer, *The Next Innocence Project*, supra note 23, at 19-20.
- 117 See Symposium, supra note 23, at 232-33 (statement of Professor Keith Findley) (asserting that neither confession nor convictions can confirm an AHT/SBS diagnosis); Findley et al., supra note 23, at 256-61 (characterizing child abuse confession research as statistically unreliable and unable to corroborate shaking as a mechanism for injury); Tuerkheimer, *The Next Innocence Project*, supra note 23, at 13-14 (suggesting that there are problems with using confessions to support the validity of AHT/SBS).
- 118 For an example from the medical witness articles, see, for example, Barnes, *Imaging of Nonaccidental Injury*, supra note 110, at 209 (asserting that prosecutions of AHT/SBS are premised on the triad). For examples from the legal articles, see Symposium, supra note 23, at 223 (statement of Professor Keith Findley) (criticizing child abuse and child homicide prosecutions that involve an AHT/SBS diagnosis as the "one area in the law where the science is used to prove all elements of the crime" because "[i]n many cases it comes down to science and nothing more than that"); Findley et al., supra note 23, at 219 (asserting that AHT/SBS is a "hypothesis that violent shaking may be reliably diagnosed based on the triad of subdural hemorrhage, retinal hemorrhage, and encephalopathy (brain damage) if the caretakers do not describe a major trauma ... and no alternative medical explanation is identified"); Tuerkheimer, *The Next Innocence Project*, supra note 23, at 11 (asserting that "the triad of symptoms was believed to be distinctly characteristic--in scientific terms, pathognomonic--of violent shaking").
- 119 For an example from the medical witness articles, see Squier, supra note 115, at 520 (characterizing the triad as not diagnostic of AHT/SBS). For examples from the legal articles, see Burg, supra note 24, at 663-64; Symposium, supra note 23, at 224-25 (statement of Professor Keith Findley) (criticizing the validity of the AHT/SBS diagnosis as "based on the belief that the triad elements were ... traumatic in origin" and that "[b]ecause the brain damage was often bilateral and widespread, it was assumed the force needed ... was comparable to ... that found in ... motor vehicle accidents" and therefore "if the history provided by the caretakers did not include a major accident, the history was considered to be inconsistent with the findings, and abuse was considered to be the only plausible explanation"); Michele Nethercott, *The Role of Forensic Science and Scientific Evidence in the Defense of Criminal Cases, in Utilizing Forensic Science in Criminal Cases* 7, 15 (2002) [7] the original notion of [AHT/SBS] proponents that an infant who

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

exhibited the triad of symptoms, including a subdural hematoma, retinal hemorrhaging, and a swollen brain, could exhibit this constellation of symptoms only as a result of a violent shaking, which had occurred shortly before the onset of the symptoms, has now been shown to be incorrect.”); Tuerkheimer, *Science-Dependent Prosecution*, supra note 23, at 516-17 (asserting that convictions in cases involving AHT/SBS diagnoses are necessarily suspect because “research has shown that retinal hemorrhages and subdural hematomas can result from forces other than shaking,” thus, “the myth of pathonomony—which told that the diagnostic triad was necessarily and exclusively induced by shaking—has been debunked”).

- 120 For examples from the medical witness articles, see Barnes, *Imaging of Nonaccidental Injury*, supra note 110, at 205-06. For an example from the legal articles see Symposium, supra note 23, at 239-40 (statement of Dr. Patrick Barnes) (“[W]e have found with advanced technology ... that there are a number of conditions that have nothing to do with trauma—for example medical illnesses including infections, bleeding or clotting problems—that can have findings that mimic abuse. And in some very young infants (e.g., under six months of age) who were thought to have been shaken or battered, their symptoms and signs actually extended from birth injuries or conditions. And this not only includes brain injury and bleeding, but also bone injuries or fractures, especially with the more recent revelations that nutritional deficiencies have come back, like vitamin D and vitamin C deficiencies, which can cause Rickets and Scurvy.”); Squier, supra note 115, at 519 (listing numerous alternative theories of causation).
- 121 For examples from the medical witness articles, see Leestma, supra note 113, at 577-78, 604-05 (asserting that lucid intervals with subdural hematomas and head injury is a well-known phenomenon); Leestma, supra note 51 (asserting that the case literature does not support the conclusion that symptoms are typically immediate). For examples from the legal articles see Symposium, supra note 23, at 229-30 (statement of Professor Keith Findley) (claiming that “we have the evidence that lucid intervals are a distinct reality” and that “research shows lucid intervals of up to seventy-two hours or more” but citing only to testimony from Dr. Robert Huntington, from the Edmunds case, that “[t]he lucid interval is a distinct discomforting but real possibility”); Findley et al., supra note 23, at 250-51 (claiming that “there is no real dispute over whether lucid intervals can occur”).
- 122 See, e.g., Kent P. Hymel et al., *Intracranial Hemorrhage and Rebleeding in Suspected Victims of Abusive Head Trauma: Addressing the Forensic Controversies*, 7 *Child Maltreatment* 329, 329-48 (2002) (addressing multiple aspects of forensic controversy); Tim Jaspán, *Current Controversies in the Interpretation of Non-Accidental Head Injury*, 38 *Pediatric Radiology* S378 (Supp. 2008) (discussing current controversies).
- 123 *Cavazos v. Smith*, 132 S. Ct. 2, 10 (2011) (Ginsburg, J., dissenting) (per curiam) (quoting *State v. Edmunds*, 746 N.W.2d 590, 596 (Wis. Ct. App. 2008)).
- 124 *Id.* at 4 (majority opinion); see also supra text accompanying note 7 (explaining that the defendant was convicted under Cal. Penal Code § 273ab (West 2008) and quoting the relevant statutory language).
- 125 *Id.* at 5 (“The jury found Smith guilty. Concluding that the jury carefully weighed the tremendous amount of evidence supporting the verdict, the trial judge denied Smith’s motion for a new trial and sentenced her to an indeterminate term of 15 years to life in prison.” (citation omitted) (internal quotation marks omitted)).
- 126 *Id.* at 5-6 (“On direct review, Smith contended that the evidence was not sufficient to establish that Etzel died from SBS. After thoroughly reviewing the competing medical testimony, the California Court of Appeal rejected this claim The California Supreme Court [also] denied review.” (citation omitted)).
- 127 *Id.* at 6 (“Smith then filed this petition for a writ of habeas corpus with the United States District Court for the Central District of California, renewing her claim that the evidence was insufficient to prove that Etzel died of SBS.”).
- 128 *Smith v. Mitchell*, 437 F.3d 884, 885 (9th Cir. 2006), vacated sub nom. *Patrick v. Smith*, 550 U.S. 915 (2007) (mem.).
- 129 *Id.* at 890. Thus, Smith served only a portion of her imposed sentence.
- 130 *Patrick*, 550 U.S. at 915.
- 131 549 U.S. 70 (2006).
- 132 *Id.* at 77.
- 133 *Smith v. Patrick*, 508 F.3d 1256, 1258 (9th Cir. 2007), vacated, 558 U.S. 1143 (2010).

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 134 558 U.S. 120 (2010).
- 135 Patrick v. Smith, 558 U.S. 1134 (2010) (mem.).
- 136 Smith v. Mitchell, 624 F.3d 1235, 1238 (9th Cir. 2010), rev'd sub nom. Cavazos v. Smith, 132 S. Ct. 2 (2011) (per curiam).
- 137 Smith, 132 S. Ct. at 2.
- 138 Smith v. Cavazos, 667 F.3d 1308, 1308 (9th Cir. 2012) (mem.). At this point Smith had been out of prison for nearly six years.
- 139 See supra note 22.
- 140 See supra Part III.A.
- 141 See Smith v. Mitchell, 437 F.3d 884, 889-90 (9th Cir. 2006), vacated sub nom. Patrick v. Smith, 550 U.S. 915 (2007). The California Court of Appeals had already rejected the defendant's challenge to the sufficiency of the evidence during her direct appeal. *Id.* at 888.
- 142 See *People v. Smith*, No. B118869 (Cal. Ct. App. Feb. 10, 2000). In addition to this unpublished decision, the authors of this Article have also reviewed the trial transcripts of each of the five medical experts who testified. This review revealed that, although the testimony of the prosecution experts encompassed nearly six-hundred pages of transcript, the appellate courts focused on the defense witnesses and summarized the prosecution witnesses' testimony in just a few paragraphs. Reporter's Transcript on Appeal, *People v. Smith*, No. B118869 (Cal. Ct. App. Feb. 10, 2000).
- 143 Repeated appeals also provide courts the opportunity to correct factual errors created when lower courts ignore or omit relevant facts. The Ninth Circuit had two opportunities to present an accurate assessment of the evidence presented at trial. Unfortunately, on both occasions, the court opted instead to microfocus on the narrow set of facts they claimed supported the conclusion that "no rational jury could find beyond a reasonable doubt, in light of all the evidence, that Smith had shaken the baby to death." *Smith v. Mitchell*, 624 F.3d 1235, 1239 (9th Cir. 2010), rev'd sub nom. *Cavazos v. Smith*, 132 S. Ct. 2 (2011). The Ninth Circuit also made the implausible claim that, to reach this conclusion, it had "not resolve[d] any disputes of historical fact against the prosecution[,] [but] ... simply assessed the prosecution's evidence on its own terms and concluded that it did not meet the Jackson standard" *Id.* (citing *Jackson v. Virginia*, 443 U.S. 307, 319 (1979) ("[T]he relevant question is whether, after viewing the evidence in the light most favorable to the prosecution, any rational trier of fact could have found the essential elements of the crime beyond a reasonable doubt.")). As such, the prosecution's evidence "was so lacking that the state court's rejection of Smith's argument over the insufficiency of the evidence was an unreasonable application of Jackson to the facts of this case." *Id.* As the Supreme Court correctly observed, in fact the Ninth Circuit simply ignored "the plenitude of expert testimony in the trial record concluding that sudden shearing or tearing of the brainstem was the cause of Etzel's death." *Smith*, 132 S. Ct. at 6. Thus, "[t]he Ninth Circuit's assertion that [the prosecution's] experts reached [their] conclusion because there is no evidence in the brain itself of the cause of death is simply false." *Id.* at 7 (internal quotation marks omitted) (third alteration in original).
- 144 *Mitchell*, 437 F.3d at 884, 885. The California appellate decision erroneously listed Etzel's date of birth as November 10, 2006. See *People v. Smith*, No. B118869, slip op. at 2.
- 145 *Smith*, 132 S. Ct. at 4.
- 146 *People v. Smith*, No. B118869, slip op. at 2.
- 147 See *id.*
- 148 *Id.*
- 149 *Id.*; *Mitchell*, 437 F.3d at 886.
- 150 *Mitchell*, 437 F.3d at 885. The opinion does not indicate who provided this testimony at the trial. However, Etzel's mother (Tomeka Smith) or Smith's sister (Renee Townsend) must have provided it. As discussed below, see *infra* Part III.C.4-5, although omitted from the decisions by the state and federal appellate courts, this trial testimony is inconsistent with statements made by both witnesses to the social services and police investigators.

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 151 People v. Smith, No. B118869, slip op. at 2.
- 152 Id. at 2-3.
- 153 Id. at 3. Etzel's ability to feed appropriately indicated he had not yet sustained any fatal injuries. The Ninth Circuit also described Tomeka's testimony as indicating that Etzel appeared perfectly healthy during the day and at the beginning of the evening when both she and Smith fed him. Mitchell, 437 F.3d at 885-86.
- 154 People v. Smith, No. B118869, slip op. at 3.
- 155 Id.
- 156 Id.
- 157 Id.
- 158 Id.
- 159 Id.
- 160 Smith v. Mitchell, 437 F.3d 884, 886 (9th Cir. 2006), vacated sub nom. Patrick v. Smith, 550 U.S. 915 (2007).
- 161 Id.
- 162 Id.
- 163 See id.
- 164 Id.
- 165 Id.
- 166 Id. According to the Ninth Circuit, Smith related this information to Tomeka. Id.
- 167 See, e.g., David L. Chadwick et al., Annual Risk of Death Resulting from Short Falls Among Young Children: Less than 1 in 1 Million, 121 Pediatrics 1213, 1213, 1220 (2008) (summarizing decades of research on short falls and noting the extreme rarity of such events).
- 168 See Brian K. Holmgren, Prosecuting the Shaken Infant Case, in *The Shaken Baby Syndrome: A Multidisciplinary Approach*, supra note 9, at 275, 287 (noting "the killer couch" among several categories of false histories about how the child became injured in SBS cases); Robert Reece, Medical Evidence in the Context of Child Abuse Litigation, 36 New Eng. L. Rev. 607, 610 (2002) (noting instances of children falling off a couch as "discrepant histories"); Nancy Lewis, Cases Face Medical and Legal Blocks, Wash. Post, Sept. 21, 1998, at A1 ("The killer couch excuse endures because there is too little training in the distinctive nature of childhood injury and too little suspicion about motives, experts say.").
- 169 See Joeli Hettler & David S. Greenes, Can the Initial History Predict Whether a Child with a Head Injury Has Been Abused?, 111 Pediatrics 602, 604-07 (2003); see also C. Henry Kempe et al., The Battered-Child Syndrome, 181 JAMA 17, 18 (1962) ("A marked discrepancy between clinical findings and historical data as supplied by the parents is a major diagnostic feature of the Battered Child Syndrome."). Ironically, the Supreme Court has itself dealt with the "killer couch" scenario in one of the few other AHT cases it has decided. See *Estelle v. McGuire*, 502 U.S. 62, 67-75 (1991) (approving admission of evidence of earlier injuries to refute this claim). Notably, neither the Ninth Circuit nor the Supreme Court's opinions in *Smith* reference this relevant precedent.
- 170 Mitchell, 437 F.3d at 886, vacated sub nom. Patrick, 550 U.S. at 915.
- 171 Id.
- 172 People v. Smith, No. B118869, slip op. at 3 (Cal. Ct. App. Feb. 10, 2000).
- 173 Id.

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 174 Id.
- 175 Id.
- 176 Id.
- 177 Smith v. Mitchell, 437 F.3d 884, 886 (9th Cir. 2006), vacated sub nom. Patrick v. Smith, 550 U.S. 915 (2007).
- 178 People v. Smith, No. B118869, slip op. at 3.
- 179 Id.
- 180 Id.
- 181 Mitchell, 437 F.3d at 886.
- 182 Id.
- 183 People v. Smith, No. B118869, slip op. at 3.
- 184 Id. at 3-4. The medical basis for this diagnosis is discussed infra in Part III.D.
- 185 Id. at 4.
- 186 Id.
- 187 Id.
- 188 Id.
- 189 Id.
- 190 Id.
- 191 Id. The Ninth Circuit described this testimony slightly differently stating, "Smith demonstrated picking up the baby under his arms and moving him quickly forward and back in a smooth motion." Smith v. Mitchell, 437 F.3d 884, 886 n.4 (9th Cir. 2006), vacated sub nom. Patrick v. Smith, 550 U.S. 915 (2007).
- 192 People v. Smith, No. B118869, slip op. at 4. Apparently Ms. Reusser testified to Smith's demonstration, but it was not videotaped. See id.
- 193 Id.; see also Cavazos v. Smith, 132 S. Ct. 2, 4 (2011) (per curiam) (noting defendant's statements to the social worker).
- 194 Smith, 132 S. Ct. at 11 n.3 (Ginsburg, J., dissenting).
- 195 People v. Smith, No. B118869, slip op. at 4.
- 196 Id.
- 197 Id.
- 198 Id.
- 199 Id.
- 200 Id.
- 201 Id.; see also Cavazos v. Smith, 132 S. Ct. 2, 4 (2011) (per curiam) (noting defendant's two contradictory statements to the police).
- 202 People v. Smith, No. B118869, slip op. at 4.

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 203 Smith v. Mitchell, 437 F.3d 884, 886 (9th Cir. 2006), vacated sub nom. Patrick v. Smith, 550 U.S. 915 (2007). Smith's changing
accounts of the events that evening were likely understood by the jury as additional nonmedical evidence tending to establish her guilt.
- 204 Id.
- 205 See *infra* Parts III.D.1, III.D.2, III.D.3 and accompanying text.
- 206 Smith, 132 S. Ct. at 11 n.3 (Ginsburg, J., dissenting).
- 207 Id. at 4 (majority opinion).
- 208 Id. at 11 (Ginsburg, J., dissenting).
- 209 Id. The jury likely understood the changing accounts of the facts from the defendant's family members as additional nonmedical
evidence tending to establish her guilt.
- 210 People v. Smith, No. B118869, slip op. at 9 (Cal. Ct. App. Feb. 10, 2000).
- 211 Smith v. Mitchell, 437 F.3d 884, 885 n.1 (9th Cir. 2006) ("Smith herself testified very briefly ... and her entire trial testimony extends
for fewer than three pages of transcript."), vacated sub nom. Patrick v. Smith, 550 U.S. 915 (2007).
- 212 Id. (noting that Smith "was subjected to almost no cross-examination").
- 213 Id. at 886.
- 214 Id.
- 215 Cavazos v. Smith, 132 S. Ct. 2, 5 (2011) (*per curiam*); People v. Smith, No. B118869.
- 216 Smith, 132 S. Ct. at 4-5.
- 217 Id.
- 218 People v. Smith, No. B116669, slip op. at 8.
- 219 Smith, 132 S. Ct. at 7; Mitchell, 437 F.3d at 887.
- 220 Reporter's Transcript on Appeal, *supra* note 142, at 717-22 (testimony of Dr. Stephanie Erlich).
- 221 See Mary Case, Forensic Pathology of Childhood Brain Trauma, 18 Brain Pathology 562, 564 (2008); Mary Case, Inflicted Traumatic
Brain Injury in Infants and Young Children, 18 Brain Pathology 571, 572 (2008) [hereinafter Case, Inflicted Traumatic Brain Injury].
- 222 People v. Smith, No. B118869, slip op. at 6.
- 223 Id.
- 224 See Smith v. Mitchell, 437 F.3d 884, 887 (9th Cir. 2006) (describing the amount of bleeding as "approximately one or two
tablespoons"), vacated sub nom. Patrick v. Smith, 550 U.S. 915 (2007).
- 225 See *id.*; Cavazos v. Smith, 132 S. Ct. 2, 11 (2011) (Ginsburg, J., dissenting) (*per curiam*) (noting small asymptomatic subdural
hematomas).
- 226 See Jennian F. Geddes et al., Neuropathology of Inflicted Head Injury in Children: I. Patterns of Brain Damage, 124 Brain 1290,
1292 (2001) (noting that out of 53 cases of inflicted fatal head trauma only four of the older children had large enough hematomas
to act as space occupying lesions while 34 had only a "trivial" quantity of subdural blood invariably described as "thin film").
- 227 See Mitchell, 437 F.3d at 890.
- 228 Email from Dr. David Chadwick, Vice-Chairman, Int'l Advisory Bd. Nat'l Ctr. on Shaken Baby Syndrome, to Dr. Randell Alexander,
Member, Int'l Advisory Bd. Nat'l Ctr. on Shaken Baby Syndrome (Sept. 22, 2012, 4:12 PM) (on file with authors) ("My notes indicate

that the neuropathologist found slit-like ventricles and optic nerve hemorrhage.... The slit[-]like ventricles require some time between injury and death.”); Dr. David Chadwick, Personal Case Notes for Testimony in *California v. Smith* (Dec. 2, 1997) (on file with authors) (“Neuropathologist noted slit-like lateral ventricles indicating some brain swelling.”). In fact, the presence of brain swelling is further evidence of direct trauma to the brain itself, since the brain's response to trauma is to swell. See generally, *Abusive Head Trauma in Infants and Children: A Medical, Legal, and Forensic Reference*, supra note 9.

229 *People v. Smith*, No. B228869, slip op. at 8 (Cal. Ct. App. Feb. 10, 2000).

230 *Id.*

231 *Id.*

232 *Id.*; see also Reporter's Transcript on Appeal, supra note 142, at 727-29 (testimony of Dr. Stephanie Erlich).

233 *Smith v. Mitchell*, 437 F.3d 884, 887 (9th Cir. 2006), vacated sub nom. *Patrick v. Smith*, 550 U.S. 915 (2007).

234 *Id.*

235 See, e.g., Randall Alexander et al., Incidence of Impact Trauma with Cranial Injuries Ascribed to Shaking, 144 *Am. J. Diseases Child.* 724, 724-26 (1990); Duhaime et al., supra note 91, at 409; James R. Gill et al., Fatal Head Injury in Children Younger than 2 Years in New York City and an Overview of the Shaken Baby Syndrome, 133 *Archives Pathology Lab Med.* 619 (2009).

236 *Mitchell*, 437 F.3d at 887.

237 *Id.* at 887-89. Ironically, most defense medical witnesses and legal commentators attempt to dismiss the significance of retinal hemorrhages when they are present, suggesting that they are caused by means other than shaking or are not diagnostic of trauma. See, e.g., Barnes, *Imaging of Nonaccidental Injury*, supra note 110, at 218; Leestma, supra note 113, at 599-600; Miller & Miller, supra note 109, at 169; Tuerkheimer, *Science-Dependent Prosecution*, supra note 23, at 516.

238 The absence of retinal hemorrhages does not preclude a diagnosis of AHT/SBS because, as numerous researchers have documented, retinal hemorrhages are not present in approximately 15-20% of AHT/SBS cases. See, e.g., Duhaime et al., supra note 91, at 410; Geddes et al., supra note 226, at 1294 (reporting presence in 71% of fatal cases); Craig E. Munger et al., Ocular and Associated Neuropathologic Observations in Suspected Whiplash Shaken Infant Syndrome, 14 *Am. J. Forensic Med. & Pathology* 193 (1993); Ralph S. Riffenburg & Lakshmanan Sathyavagiswaran, The Eyes of Child Abuse Victims: Autopsy Findings, 36 *J. Forensic Scis.* 741, 742 (1991) (reporting retinal hemorrhages in forty-seven of seventy-seven suspected child abuse deaths); Brandon Togioka et al., Retinal Hemorrhages and Shaken Baby Syndrome: An Evidence-Based Review, 37 *J. Emergency Med.* 98, 100 (2009) (providing a systematic review of the medical literature on retinal hemorrhages and noting a 53-80% incidence in AHT); Dimitra Tzioumi & R. Kim Oates, Subdural Hematomas in Children Under 2 Years. Accidental or Inflicted? A 10-Year Experience, 22 *Child Abuse & Neglect* 1105, 1108 (1998).

239 Reporter's Transcript on Appeal, supra note 142, at 1276-78, (testimony of Dr. Stephanie Erlich).

240 See *id.* at 1298-99.

241 *Id.* at 1270-71.

242 *Id.* at 1303-05.

243 *Id.*

244 *Id.* at 1319-20. For further discussion of the rebleeding claim and the lack of scientific support for this frequent “alternative theory” proposed by the defense, see generally Barbara L. Knox et al., Subdural Hematoma Rebleeding, in *Abusive Head Trauma: Pocket Atlas* (Kay Rauth-Farley & L. Frasier eds.) (forthcoming 2013).

245 *Cavazos v. Smith*, 132 S. Ct. 2, 7 (2011) (per curiam).

246 See Reporter's Transcript on Appeal, supra note 142, at 730-31, 1324 (testimony of Dr. Stephanie Erlich).

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 247 *Id.* at 801-02. Specifically, trauma to areas of the brain that control heartbeat and respiration leads to a quick death that would not necessarily be recognizable through microscopic examination of the brainstem. *Id.* at 1297-99.
- 248 *Smith v. Mitchell*, 437 F.3d 884, 887 (9th Cir. 2006), vacated sub nom. *Patrick v. Smith*, 550 U.S. 915 (2007); see also Reporter's Transcript on Appeal, supra note 142, at 803-05 (testimony of Dr. Stephanie Erlich) (noting that changes to the brainstem would not have been detectable unless the baby survived for a period of time). Dr. Erlich's conclusion is confirmed by the medical literature. See S.M. Gentleman et al., Axonal Injury: A Universal Consequence of Fatal Closed Head Injury?, 89 *Acta Neuropathologica* 537, 537, 541 (1995) (noting that the frequency of axonal damage had been vastly underestimated using conventional techniques and newer techniques using Beta Amyloid Protein Precursor (BAPP) were revealing much more prevalent axonal damage). Dr. Chadwick's trial testimony described the advent of new staining techniques--although he did not mention the BAPP technique by name--noting their capacity to reveal this type of brainstem damage, but that they were not yet widely available. See *infra* notes 283-285 and accompanying text. Had BAPP staining been more widely available at the time of Etzel's death, the likelihood of detection of axonal damage would have been substantially greater, although far from certain due to his rapid death. See, e.g., P. Shannon et al., Axonal Injury and the Neuropathology of Shaken Baby Syndrome, 95 *Acta Neuropathologica* 625, 630 (1998) (indicating that at the time of this study, which used BAPP staining techniques to evaluate the brains of fatal abuse victims, there had been only a single series previously reported using silver stains--findings of this study identified axonal injury in the spinal cord suggesting that flexion-extension injury to the cervical spinal column may be caused during shaking); F.E. Sheriff et al., Markers of Axonal Injury in Post Mortem Human Brain, 88 *Acta Neuropathologica* 433, 433-34 (1994) (noting minimal survival time of 2.5 hours for detection of axonal swelling in adults using BAPP staining). Similar results have been induced in an animal model. See Endre Czeiter et al., Traumatic Axonal Injury in the Spinal Cord Evoked by Traumatic Brain Injury, 25 *J. Neurotrauma* 205, 206-10 (2008) (noting the implications this finding has for SBS).
- 249 See Reporter's Transcript on Appeal, supra note 142, at 766-67 (testimony of Dr. Stephanie Erlich). Similarly, people who die of heart attacks do not show evidence of this in their heart tissue if they die immediately because it takes time for damage to the heart tissue to be seen. *Id.* at 805.
- 250 See sources cited supra note 248.
- 251 See supra note 228 and accompanying text.
- 252 *Cavazos v. Smith*, 132 S. Ct. 2, 7 (2011) (*per curiam*).
- 253 *Id.*
- 254 *Id.* (citation omitted).
- 255 *Id.* at 4-5.
- 256 *People v. Smith*, No. B118869, slip op. at 1, 6 (Cal. Ct. App. Feb. 10, 2000). A SIDS diagnosis is precluded by Etzel's significant internal injuries because under medical guidelines promulgated prior to 1996, and still used today, SIDS can only be diagnosed in a child who had a "negative autopsy" (i.e., an autopsy that had no other findings that could explain cause of death). See, e.g., Comm. on Child Abuse & Neglect, Distinguishing Sudden Infant Death Syndrome from Child Abuse Fatalities, 94 *Pediatrics* 124, 125 (1994) (listing sources and noting the requirement that the autopsy show no gross or microscopic evidence of head injury or intracranial trauma).
- 257 *People v. Smith*, No. B118869, slip op. at 6.
- 258 *Id.*
- 259 *Id.* at 6-7. There are several additional ways for brain injury and death to occur. See R.A. Minns, Shaken Baby Syndrome: Theoretical and Evidential Controversies, 35 *J. Royal C. Physicians Edinburgh* 5, 10 (2005) (documenting four mechanisms for fatal trauma including the mechanism described by the prosecution's experts at Smith's trial, and discussed *infra* note 334 and accompanying text). See generally Geddes et al., supra note 226 (studying fifty-three nonaccidental head injuries in children and finding skull fractures, acute subdural bleeding, retinal hemorrhages to be the most common injuries).
- 260 *People v. Smith*, No. B118869, slip op. at 7; see also supra notes 224-226, 246-247 and *infra* notes 329-331 and accompanying text (discussing Dr. Erlich's testimony describing how AHT/SBS typically does not present itself with a large volume of subdural blood

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

causing a mass effect on the brain, but instead serves as a "marker" for rotational injury to the brain involving shaking or shaking combined with impact).

261 People v. Smith, No. B118869, slip op. at 7.

262 Id. On cross-examination Dr. Carpenter acknowledged that one of Etzel's injuries, subdural hemorrhages, could occur from a fall. Id. at 8. The medical literature indicates that such findings are exceedingly rare, however, and are typically focal in nature, confined to the location of the impact. See, e.g., Ann-Christine Duhaime et al., Nonaccidental Head Injury in Infants--The "Shaken-Baby Syndrome," 338 New Eng. J. Med. 1822, 1822 (1998) ("[M]ost investigators agree that trivial forces, such as those involving routine play, infant swings, or falls from a low height are insufficient to cause [SBS]."). Etzel's subdural hemorrhage and subarachnoid hemorrhage injuries are diffuse and indicative of a more global injury to the brain produced from rotational trauma seen with SBS.

263 People v. Smith, No. B118869, slip op. at 7.

264 Id. at 7-8. Laura K. Brennan et al., Neck Injuries in Young Pediatric Homicide Victims, 3 J. Neurosurgery Pediatrics 232, 232 (2009) (finding that retinal hemorrhages are present in 80% of cases and 30-50% have skeletal injuries of various ages).

265 People v. Smith, No. B118869, slip op. at 8.

266 Birth-related subdural hemorrhages typically resolve by one month of age and are distinct from both the acute hemorrhages and the older subdural hematoma found in Etzel's brain. The scattered pattern of acute subdural and subarachnoid bleeding throughout Etzel's brain is also inconsistent with the theory that a chronic subdural from birth has rebled. See E.H. Whitby et al., Frequency and Natural History of Subdural Hemorrhages in Babies and Relation to Obstetric Factors, 362 Lancet 846, 847-50 (2004) (controlled research concluding that birth-related subdural hemorrhages are rare, benign, have clinically insignificant sequelae, and resolve by one month); see also Surya N. Gupta et al., Intracranial Hemorrhage in Term Newborns: Management and Outcomes, 40 Pediatric Neurology 1, 11 (2009) (summarizing the typical treatment for intracranial hemorrhages and suggesting possible improvements); Knox et al., supra note 244 (summarizing research on rebleeding theory and concluding that rebleeds in children do not result in the spectrum of injuries and sudden collapse seen with AHT); Christopher B. Looney et al., Intracranial Hemorrhage in Asymptomatic Neonates: Prevalence on MR Images and Relationship to Obstetric and Neonatal Risk Factors, 242 Radiology 535, 538 (2007) (finding that seventeen out of eighty-eight asymptomatic neonates born via vaginal delivery had subdural hemorrhages).

267 Cavazos v. Smith, 132 S. Ct. 2, 5 (2011) (per curiam).

268 Reporter's Transcript on Appeal, supra note 142, at 1436-37 (testimony of Dr. Chadwick).

269 Id. at 1440-44.

270 Id. at 1448-49.

271 Id. at 1448-49, 1476-77, 1480-82.

272 Id. at 1495.

273 Id. at 1460-61.

274 Id. at 1450-54. In AHT/SBS cases, defendants and their medical witnesses frequently assert that infants with severe or fatal head injuries experience a "lucid interval" of significant duration between the traumatic injury and when the child becomes severely symptomatic and unconscious. Medical research and clinical experience, however, do not support these claims but instead confirm the testimony offered by Dr. Chadwick--that children with severe and fatal head injuries do not experience significant periods of lucidity and are not asymptomatic. See Adamsbaum et al., supra note 49, at 550, 554; Mary E. Case, Head Injury in Child Abuse, in Child Maltreatment: A Clinical Guide and Reference, supra note 9, at 87, 95 [hereinafter Case, Head Injury in Child Abuse]; Mary E. Case et al., Position Paper on Fatal Abusive Head Injuries in Infants and Young Children, 22 Am. J. Forensic Med. & Pathology 112, 118-19 (2001); Duhaime et al., supra note 262, at 1825; Geddes et al., supra note 226, at 1303; M.G.F. Gilliland, Interval Duration Between Injury and Severe Symptoms in Nonaccidental Head Trauma in Infants and Young Children, 43 J. Forensic Sci. 723, 724 (1998); Tom. D. Lyon et al., Medical Evidence of Physical Abuse in Infants and Young Children, 28 Pac. L.J. 93, 146, 163 (1996); Starling et al., Analysis of Perpetrator Admissions, supra note 49, at 456-57; Starling et al., Abusive Head Trauma, supra note 49, at 261; Krista Y. Willman et al., Restricting the Time of Injury in Fatal Inflicted Head Injuries, 21 Child Abuse & Neglect 929,

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

938-39 (1997). Both Dr. Starling and Dr. Adamsbaum's research confirms that perpetrators who confess to shaking and other forms of AHT consistently report that children are immediately symptomatic. Adamsbaum, *supra* note 49, at 551; Starling et al., *Analysis of Perpetrator Admissions*, *supra* note 49, at 456. In fact, Dr. Gilliland's research found that in all cases where there was a person (other than the suspect) present at the time of injury, the child was immediately symptomatic. Gilliland, *supra*, at 724. But see Kristy B. Arbogast et al., *Initial Neurologic Presentation in Young Children Sustaining Inflicted and Unintentional Fatal Head Injuries*, 116 *Pediatrics* 180, 180-84 (2005) (pointing out that the Willman study involved only two infants and arguing that lucidity does not imply that children are asymptomatic because the Glasgow Coma Scale does not measure common symptoms such as vomiting, irritability, or subtle changes in alertness which means that children with less severe injuries from AHT may exhibit symptoms that do not precipitate a medical crisis and consequently may not be brought in for medical treatment and their head trauma may be undiagnosed); Antoinette L. Laskey et al., *Occult Head Trauma in Young Suspected Victims of Physical Abuse*, 144 *Pediatrics* 719 (2004).

- 275 Reporter's Transcript on Appeal, *supra* note 142, at 1480 (testimony of Dr. Chadwick).
- 276 *Id.*
- 277 *Id.* In other circumstances, however, death might occur hours or days later as a result of brain swelling. *Id.* at 1477.
- 278 *Id.* at 1446-49, 1466, 1474 (explaining that this blood is not what hurts or kills the baby, rather it is the damage to the brain itself and the blood is an indicator of this injury); see also *id.* at 1467-68 (describing how the older bleeding on Etzel's brain indicated an earlier less severe injury of a similar nature).
- 279 *Id.* at 1463-65, 1490.
- 280 *Id.* at 1467-68.
- 281 *Id.* at 1446-47.
- 282 *Id.* at 1455-59 (describing his own research and publications in this arena and that of others). Since this trial testimony, Dr. Chadwick has published a meta-analysis of the short-fall research. See Chadwick et al., *supra* note 167.
- 283 Reporter's Transcript on Appeal, *supra* note 142, at 1448-49 (testimony of Dr. Chadwick) (describing new techniques to identify these injuries not used in this autopsy and not widely available at the time).
- 284 *Id.* at 1483-84
- 285 *Id.*
- 286 *Id.* at 1491-93.
- 287 *Id.* at 1469.
- 288 *Id.*
- 289 *People v. Smith*, No. B118869, slip op. at 9 (Cal. Ct. App. Feb. 10, 2000).
- 290 *Id.*
- 291 *Id.*
- 292 See sources cited *supra* note 238.
- 293 *People v. Smith*, No. B118869, slip op. at 9.
- 294 *Id.* at 9-10.
- 295 *Smith v. Mitchell*, 437 F.3d 884, 888 (9th Cir. 2006), vacated sub nom. *Patrick v. Smith*, 550 U.S. 915 (2007).
- 296 See *id.*
- 297 See *supra* notes 219-232, 240-244 and accompanying text

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 298 See Cavazos v. Smith, 132 S. Ct. 2, 5 (2011) (per curiam).
- 299 People v. Smith, No. B118869, slip op. at 9-10.
- 300 Id. at 10.
- 301 Id. According to the Ninth Circuit, Dr. Goldie described some of the characteristics that led him to conclude that Etzel died of SIDS. Mitchell, 437 F.3d at 888, vacated sub nom. Patrick, 550 U.S. at 915. Dr. Goldie specified, "With SIDS, the infant usually would appear normal, but then he or she suddenly would die." Id. Furthermore, Dr. Goldie stated, "SIDS occurred more frequently in babies who, like Etzel, were small for their age, who had mothers who had multiple children already or smoked or used drugs, and, most importantly, who had been placed face-down on their stomachs." Id. Finally, Dr. Goldie indicated, "Males were more likely victims than females." Id. But the medical research on SIDS diagnosis does not support Dr. Goldie's conclusion that these factors, individually or in combination, support a finding that Etzel died of SIDS. See Comm. on Child Abuse & Neglect, supra note 256 (explaining that SIDS can only be diagnosed in a child who had a "negative autopsy" and therefore a SIDS diagnosis was precluded by Etzel's significant internal injuries (i.e., the presence of old and acute subdural hemorrhage, old and acute optic nerve hemorrhage, and abrasion trauma to the neck)).
- 302 People v. Smith, No. B118869, slip op. at 10. There is no medical evidence to support Dr. Goldie's assertion that CPR can cause subdural or subarachnoid hemorrhage. See Evan W. Matshes, Emma O. Lew, Do Resuscitation-Related Injuries Kill Infants and Children?, 31 Am J Forensic Med. & Pathology 178 (2010).
- 303 Mitchell, 437 F.3d at 888.
- 304 People v. Smith, No. B118869, slip op. at 10.
- 305 Id.
- 306 See supra notes 224-226 and accompanying text.
- 307 See supra notes 227-228, 247-251, 258-259, 270-275 and accompanying text.
- 308 Cavazos v. Smith, 132 S. Ct. 2, 9 (2011) (Ginsburg, J., dissenting) (per curiam).
- 309 Id.
- 310 Id. at 7 (majority opinion).
- 311 Id. at 9 (Ginsburg, J., dissenting) (citations omitted).
- 312 Id. But see supra notes 245-251 and infra notes 329-332 and accompanying text.
- 313 Id. But see supra notes 245-251 and infra notes 329-332 and accompanying text.
- 314 See Smith v. Mitchell, 437 F.3d 884, 887 (9th Cir. 2006), vacated sub nom. Patrick v. Smith, 550 U.S. 915 (2007). This opinion is confirmed by the fact that in 1996 the staining techniques generally available to detect such injury--hematoxylin-eosin (H&E) stains--required the victim to survive for nearly fifteen hours. See Gentleman et al., supra note 248, at 537 (noting that the frequency of axonal damage had been vastly underestimated using conventional silver techniques and newer techniques using BAPP were revealing much more prevalent axonal damage).
- 315 See sources cited supra note 248 (discussing new techniques). Although Dr. Chadwick did not mention the BAPP technique by name, had BAPP staining been more widely available at the time of Etzel's death, the likelihood of detection of axonal damage would have been substantially greater, although far from certain due to his rapid death. But see Manfred Oehmichen et al., Shaken Baby Syndrome: Re-examination of Diffuse Axonal Injury as Cause of Death, 116 Acta neuropathologica 317, 317-29 (2008) (not detecting this pattern of injury and ascribing multiple causes for the disruption of breathing mechanisms resulting from shaking). For an excellent overview of these issues, see Lucy B. Rorke-Adams, Neuropathology of Abusive Head Trauma, in Child Abuse and Neglect: Diagnosis, Treatment, and Evidence, supra note 9, at 413; 4 Case for Shaking see also J.F. Geddes et al., Neuropathology of Inflicted Head Injury in Children: II. Microscopic Brain Injury in Infants, 124 Brain 1299, 1299-306 (2001).

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 316 Reporter's Transcript on Appeal, *supra* note 142, at 1449 (testimony of Dr. David L. Chadwick).
- 317 See *supra* notes 219-221, 246-251, 278 and accompanying text.
- 318 Mitchell, 437 F.3d at 890 (emphasis omitted).
- 319 Emmanuil Magiorkinis et al., *Scurvy: Past, Present and Future*, 22 Eur. J. Internal Med. 147, 147 (2011).
- 320 *Id.* at 147-48.
- 321 *Id.* at 149-50.
- 322 Cavazos v. Smith, 132 S. Ct. 2, 9 (2011) (Ginsburg, J., dissenting) (*per curiam*).
- 323 Mitchell, 437 F.3d at 887.
- 324 People v. Smith, No. B118869, slip op. at 6 (Cal. Ct. App. Feb. 10, 2000).
- 325 *Id.*
- 326 *Id.*
- 327 *Id.*
- 328 Mitchell, 437 F.3d at 887.
- 329 See *supra* notes 226, 246-247, 259-260, 278 and accompanying text..
- 330 See Case, *Inflicted Traumatic Brain Injury*, *supra* note 221, at 576.
- 331 See, e.g., *id.* at 573 (noting that subdurals may involve less than 5-10 mL of blood); Geddes et al., *supra* note 226, at 1291-94 (noting out of fifty-three cases of inflicted fatal head trauma only four of the older children had large enough hematomas to act as space occupying lesions while thirty-four had only a "trivial" quantity of subdural blood invariably described as "thin film").
- 332 People v. Smith, No. B118869, slip op. at 7. It is also consistent with Dr. Chadwick's testimony. See *supra* notes 270-272, 278 and accompanying text.
- 333 Cavazos v. Smith, 132 S. Ct. 2, 9 (2011) (Ginsburg, J., dissenting) (*per curiam*).
- 334 People v. Smith, No. B118869, slip op. at 7. The doctors at Etzel's trial primarily discussed the two mechanisms as listed above. Another mechanism, which was not described, involves a primary injury to the brain (e.g., torn or damaged brain tissue) causing the brain to swell in response to this injury. A second mechanism is via hypoxic-ischemic injury to the brain. In these cases, trauma causes a disruption in breathing that produces a lack of oxygen and hypoxic insult. The medical evidence presented by all three prosecution experts indicated that Etzel died quickly as a result of this second injury mechanism. But this hypoxic insult can also occur over a protracted time frame with hypoxia being caused by ongoing swelling. Other medical literature describes additional mechanisms of injury and ongoing research continues to elucidate additional primary and secondary injury mechanisms. See Minns, *supra* note 259, at 11-12 (describing four principle patterns of presentation). Ongoing research into the brain's biochemical responses to traumatic injury is providing additional information regarding injury pathways. See Rachel P. Berger & Noel Zuckerbraun, *Biochemical Markers, in Mild Traumatic Brain Injury in Children and Adolescents: From Basic Science to Clinical Management* 145-61 (Michael W. Kirkwood & Keith Owen Yates eds., 2012).
- 335 People v. Smith, No. B118869, slip op. at 6-7. Brain swelling takes time to occur and does not continue after death, so if the child dies quickly following trauma then the swelling would be minimal and would not be the direct cause of brain herniation or death. Dr. Carpenter's opinions are confirmed in subsequent research, including two articles published in 2001 by Dr. Jennian Geddes describing the pathophysiology of brain trauma and concluding that shaking trauma can disrupt respiratory centers in the brain stem and cause hypoxic injury to babies which is precisely the cause of death described by the prosecution experts here. See Geddes et al., *supra* note 226; Geddes et al., *supra* note 315; Rorke-Adams, *supra* note 315.

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 336 See supra notes 245-251, 259, 270-272 and accompanying text.
- 337 *Smith v. Mitchell*, 624 F.3d 1235, 1238 (9th Cir. 2010), rev'd sub nom. *Cavazos v. Smith*, 132 S. Ct. 2 (2011). See also supra notes 227-228, 247-248, 258-260 and accompanying text.
- 338 Reporter's Transcript on Appeal, supra note 142, at 1480 (testimony of Dr. Chadwick).
- 339 *Id.* In other circumstances, however, death might occur hours or days later as a result of brain swelling. *Id.* at 1477.
- 340 *Cavazos v. Smith*, 132 S. Ct. 2, 9 (2011) (Ginsburg, J., dissenting) (per curiam).
- 341 See *id.*
- 342 See supra note 238 and accompanying text.
- 343 *Smith*, 132 S. Ct. 2 at 5.
- 344 See *id.* at 9 (Ginsburg, J., dissenting).
- 345 See *Boos*, supra note 62, at 49-74 (noting the large percentage of cases without evidence of skeletal damage); see also *infra* notes 386-388 and accompanying text.
- 346 See *Smith*, 132 S. Ct. at 9 (Ginsburg, J., dissenting).
- 347 *Smith v. Mitchell*, 624 F.3d 1235, 1238 (9th Cir. 2010), rev'd sub nom. *Smith*, 132 S. Ct. at 2; *Smith v. Mitchell*, 437 F.3d 884, 887 (9th Cir. 2006), vacated sub nom. *Patrick v. Smith*, 550 U.S. 915 (2007).
- 348 See supra notes 233-235 and accompanying text (discussing the diagnostic significance of Etzel's scalp abrasion).
- 349 See *Duhaime et al.*, supra note 262, at 1822.
- 350 *People v. Smith*, No. B118869, slip op. at 7 (Cal. Ct. App. Feb. 10, 2000). On cross-examination Dr. Carpenter acknowledged that one of Etzel's injuries, subdural hemorrhages, could occur from a fall. *Id.* at 8. But the medical literature indicates that such findings are exceedingly rare and are typically focal in nature, confined to the location of the impact. See *Case, Head Injury in Child Abuse*, supra note 274, at 93, 99; *Case, Inflicted Traumatic Brain Injury*, supra note 221 at 572-73. Etzel's subdural hemorrhage and subarachnoid hemorrhage injuries are diffuse and indicative of a more global injury to the brain produced from rotational trauma seen with shaken baby/shaken impact syndrome.
- 351 *People v. Smith*, No. B118869, slip op. at 7.
- 352 See, e.g., *Duhaime et al.*, supra note 91, at 411; *Gill et al.*, supra note 235, at 621.
- 353 *Cavazos v. Smith*, 132 S. Ct. 2, 3-4 (2011) (per curiam) ("The opinion of the Court in *Jackson v. Virginia*, 443 U.S. 307 (1979), makes clear that it is the responsibility of the jury--not the court--to decide what conclusions should be drawn from evidence admitted at trial.").
- 354 *Id.* at 4.
- 355 *Id.* (quoting *Renico v. Lett*, 130 S. Ct. 1855, 1862 (2010)).
- 356 28 U.S.C. § 2254(d)(1) (2006).
- 357 *Smith*, 132 S. Ct. at 6 (quoting 28 U.S.C. § 2254(d)(1)).
- 358 *Id.* at 5-6.
- 359 *Id.* at 7.
- 360 See *id.*

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 361 Id. at 8 (Ginsburg, J., dissenting) (quoting *Smith v. Mitchell*, No. CV 01-4484-ABC, slip op. at 10 (C.D. Cal. Mar. 22, 2004) (report and recommendation)). The Ninth Circuit opinion not only echoed these comments, but took them a step further stating, Nothing significant in the background suggests guilt, therefore, and many factors suggest innocence. Indeed, not only was there no evidence of any ‘precipitating event that might have caused [Smith] to snap,’ but it is extremely unlikely that even a very troublesome act by seven-week-old Etzel would cause Smith to shake Etzel to death when his mother lay but a few feet away and easily available. A constitutionally permissible finding of guilt in this case therefore depends on the expert evidence of the cause of death. *Smith v. Mitchell*, 437 F.3d 884, 889 (9th Cir. 2006), vacated sub nom. *Patrick v. Smith*, 550 U.S. 915 (2007). This inappropriate and speculative commentary from the appellate court does not reflect the proper postconviction review standard, which requires that the evidence be viewed in the light most favorable to supporting the conviction.
- 362 *Smith*, 132 S. Ct. at 8 (Ginsburg, J., dissenting).
- 363 Id.
- 364 Id.
- 365 Id.
- 366 Id.
- 367 Id.
- 368 Id.
- 369 Id.
- 370 Id. at 9.
- 371 Id.
- 372 Id.
- 373 Id. at 11-12.
- 374 See, e.g., id. at 5-6 (majority opinion); *Smith v. Mitchell*, 437 F.3d 884, 885 (9th Cir. 2006) (same), vacated sub nom. *Patrick v. Smith*, 550 U.S. 915 (2007).
- 375 See *Mitchell*, 437 F.3d at 888-90. The California Court of Appeals has already rejected defendant’s challenge to the sufficiency of the evidence during her direct appeal. Id. at 885. In her federal habeas petition, Smith claimed that her due process rights were violated because the evidence was “constitutionally insufficient” particularly with respect to “one element of the crime--the cause of the child’s death.” Id.
- 376 Cal. Penal Code § 273ab (West 2008).
- 377 According to Justice Ginsburg:
In sum, this is a notably fact-bound case in which the Court of Appeals unquestionably stated the correct rule of law. It is thus “the type of case in which we are most inclined to deny certiorari.” Nevertheless, the Court is bent on rebuking the Ninth Circuit for what it conceives to be defiance of our prior remands. I would not ignore Smith’s plight and choose her case as a fit opportunity to teach the Ninth Circuit a lesson.
Smith, 132 S. Ct. at 12 (Ginsburg, J., dissenting) (citations omitted) (quoting *Kyles v. Whitley*, 514 U.S. 419, 460 (1995) (Scalia, J., dissenting)). Of course, the *Smith* majority concluded that the Ninth Circuit had erroneously overturned Smith’s conviction, which means that any “liberty” Smith enjoyed was erroneously granted in the first place.
- 378 Id. at 7 (majority opinion).
- 379 Id.
- 380 See, e.g., *Lazoritz et al.*, supra note 15, at 1011 tbl.1; *Suzanne Starling et al.*, *Abusive Head Trauma*, supra note 49, at 260-61.

DISSENT INTO CONFUSION: THE SUPREME COURT, ..., 2013 Utah L. Rev. 153

- 381 See Frasier et al., *supra* note 9, at 406 (noting that those who abuse children, “[w]ith rare exceptions ... do so in private ... and maintain a completely normal appearance in every other way”).
- 382 In child abuse cases, [j]urors and judges frequently have a difficult time conceptualizing parents as abusers of their children. They are reluctant to believe that an apparently loving caretaker would purposely injure their child. Many SBS cases do not involve caretakers who deliberately set out to kill or injure the child by violently shaking them. Rather these consequences often result from the caretaker's loss of control and momentary violent behavior directed toward the child. This explanation does not mean that SBS cases are “unintentional” crimes within the legal definition of “intent,” or that the offender is less culpable because they did not specifically set out to kill or maim the baby. Shaking a vulnerable infant is still a deliberate act of extreme violence which justifies holding the caretaker accountable for the dire consequences which ensue. Holmgren, *supra* note 168, at 289; see also Frasier et al., *supra* note 9, at 399, 408 (noting “[t]here is no ‘profile’ of typical child abusers,” and “people who cause serious head injuries to children may have never harmed anyone prior to that,” but still merit “prosecution and punishment” notwithstanding claims by character witnesses suggesting the caretakers are loving and are not the type of people who could ever harm a child).
- 383 See W. Hobart Davies & Molly Murphy Garwood, Who Are the Perpetrators and Why Do They Do It?, in *The Shaken Baby Syndrome: A Multidisciplinary Approach*, *supra* note 9, at 41, 49.
- 384 The then applicable rule of evidence barred admission of bad character or prior conduct evidence for propensity purposes, but allowed it to show motive, intent, knowledge, or the absence of mistake or accident. Cal. Evid. Code § 1101(b) (West 2009). The current California evidentiary rule permits the evidence for propensity purposes.
- 385 See *Abusive Head Trauma in Infants and Children: A Medical, Legal, and Forensic Reference*, *supra*, note 9 at 358; *The Shaken Baby Syndrome: A Multidisciplinary Approach*, *supra* note 9, at 238, 284.
- 386 See *supra* note 345 and accompanying text.
- 387 See Goldberg, *supra* note 100 (quoting Allison Scobie-Carroll, Program Director, Child Protection Program, Children's Hospital Boston, who has also commented that “[e]ach year our team consults on approximately 1800 cases of child maltreatment. And each year we are directly involved in the care of dozens of cases of abusive head trauma. It has been my experience that despite our wishes to the contrary, some caregivers (even those with no known documented history of violence toward others, and even those who closely resemble the very lawyers and physicians enlisted to defend them) do, in fact, inflict devastating and irrevocable harm on children”); see also Boos, *supra* note 62, at 51 (noting that between 38-65% of cases lack skeletal findings such as rib or metaphyseal fractures); Lazoritz et al., *supra* note 15 (noting skull fractures found in 13 of 71 (18.3%) AHT patients, and 23 (32.4%) having rib or long bone fractures); Duhaime, *supra* note 91, at 410 (noting extracranial trauma in only 37% of the cases and old trauma in only 6%).
- 388 *Cavazos v. Smith*, 132 S. Ct. 2, 5 (2011) (*per curiam*).
- 389 *Id.* at 11 (Ginsburg, J., dissenting).
- 390 *Id.*
- 391 *Id.*
- 392 *Id.*
- 393 See Cal. Penal Code § 273ab (West 2008) (“Any person who, having the care or custody of a child who is under eight years of age, assaults the child by means of force that to a reasonable person would be likely to produce great bodily injury, resulting in the child's death, shall be punished by imprisonment”).
- 394 *Smith*, 132 S. Ct. at 11 (Ginsburg, J., dissenting).
- 395 See, e.g., Duhaime, *supra* note 91, at 410 tbl.2; Carole Jenny et al., Analysis of Missed Cases of Abusive Head Trauma, 282 JAMA 621, 622 (1999); James A. O'Neill et al., Patterns of Injury in the Battered Child Syndrome, 13 J. Trauma 332, 332 (1973). See also *supra* notes 168-169 and accompanying text.

DISSENT INTO CONFUSION: THE SUPREME COURT,..., 2013 Utah L. Rev. 153

- 396 Smith, 132 S. Ct. at 11 (Ginsburg, J., dissenting). According to the dissenters, “[t]he social worker also testified that Etzel’s mother, Tomeka, told Smith: ‘If it wasn’t for you this wouldn’t have happened.’” Id. at n.3. On this point, Justice Ginsburg simply ignored the requirement that the reviewing court take this evidence as true adding only that “Tomeka denied making any statement to that effect.” Id.
- 397 Id. at 10.
- 398 Id.
- 399 Moreno & Holmgren, *supra* note 17.
- 400 See sources cited *supra* notes 8-9.
- 401 See Christian & Block, *supra* note 15, at 1409-11 (setting forth the American Academy of Pediatrics position paper on AHT and discussing the public health and prevention efforts encouraged by the Academy to educate parents about the dangers of shaking).

2013 UTLR 153

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